

Dental Digest

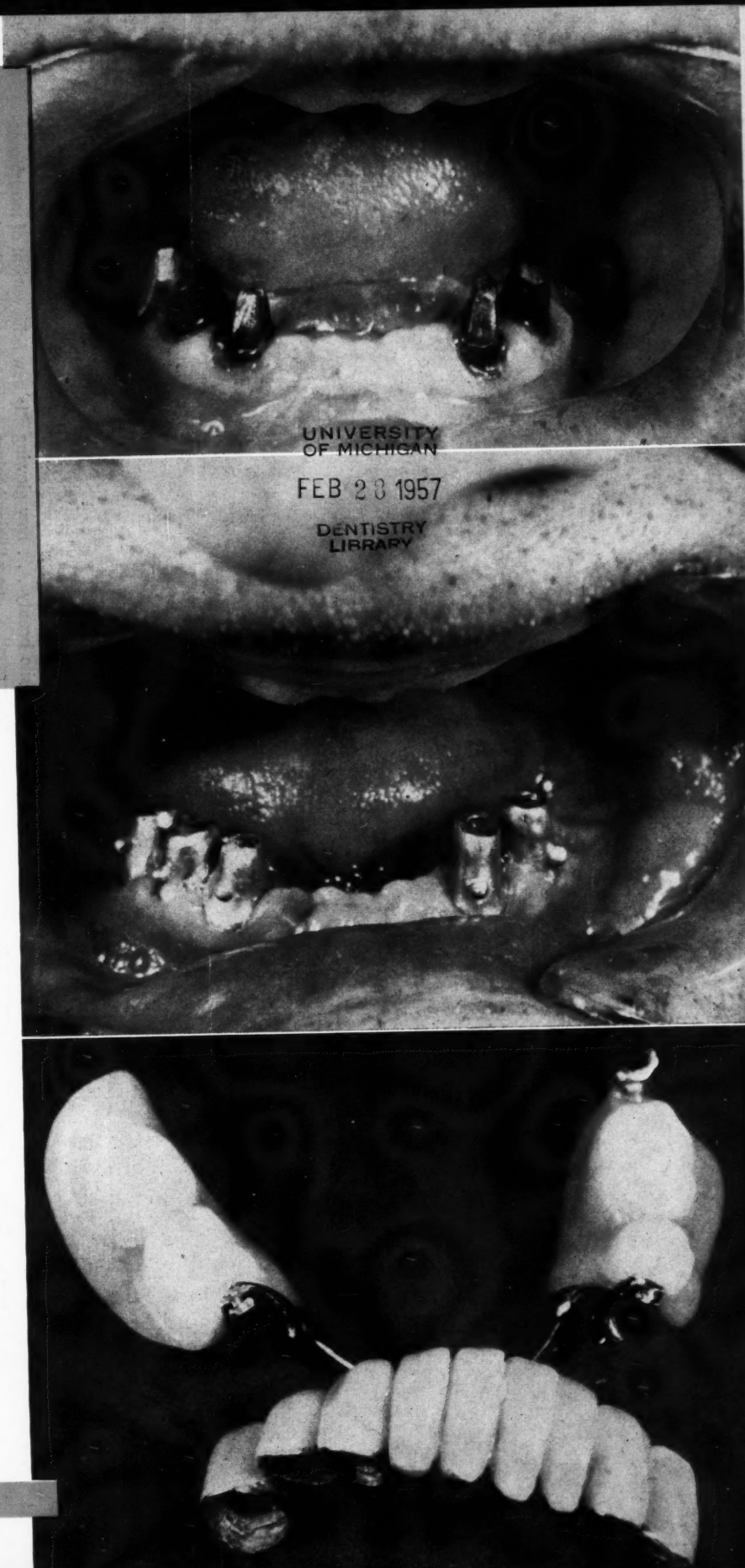
February 1957

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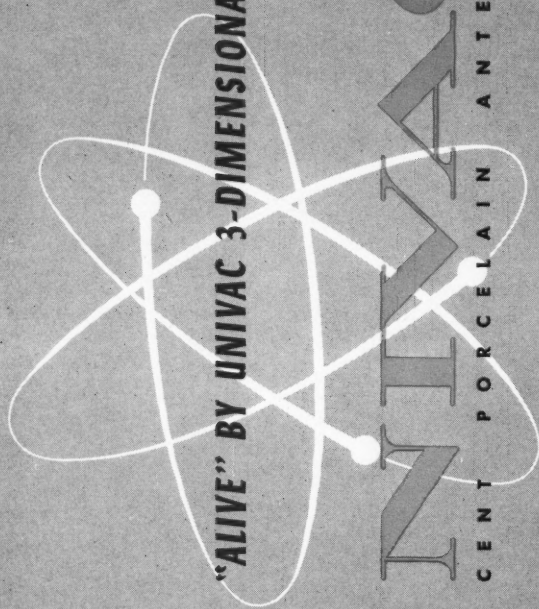
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FORCE DISTRIBUTION

in Mastication, Clenching, and Bruxism

Part One

LAWRENCE A. WEINBERG, A.B., D.D.S., Brooklyn, New York

DIGEST

In this installment, the first of two illustrated articles, the author discusses some of the physiologic forces exerted on the periodontal support of the teeth due to mastication, attrition, incline plane relation, clenching, and bruxism.

Variation in Opinion

Fundamental knowledge of the physiology of occlusion has been broadened in recent years with outstanding contributions from many sources, although there has been considerable variation of opinion as to interpretation and method of correction.

Value of Attrition Debated—Begg¹ expresses the opinion that the marked attrition found in primitive man is desirable whereas Weinberger² does not feel that marked attrition is the ideal. Beyron³ and Granger⁴ also agree that flat worn teeth are not necessarily good for the periodontal support of the teeth.

Methods of Correction Vary—There have also been considerable differences in approach to the correction of occlusal trauma. Jankelson⁵ and Kurth⁶ advocate occlusal grinding on the lower buccal and the upper lingual

cusps in contrast to the classical buccal cusp of the upper and the lingual cusp of the lower recommended by Schuyler, Sorrin, Miller, and Blass.^{7, 8, 9, 10}

Mastication:

Chewing Pattern

The chewing cycle, viewed from the anterior, basically presents a tear-shaped pattern.¹¹ The mandible drops to accommodate the bolus and then moves laterally in preparation for the thrust toward centric with the food held between the teeth. This smooth pattern carried out by the muscles of mastication can be modified in some degree by individual variation, condylar path, and certainly by pathologic conditions.

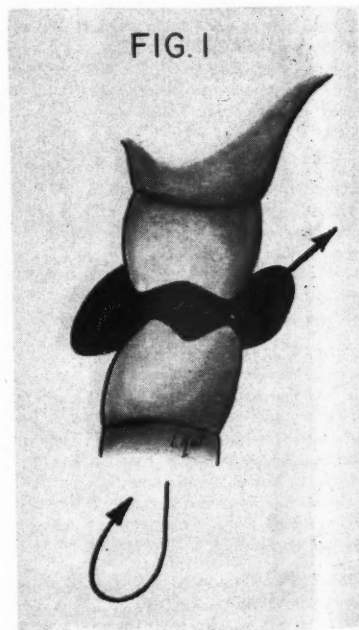
Movement of Bolus—This general pattern of jaw movement influences the movement of the bolus. The food is held by the upper teeth and the musculature in position as the lower teeth tear it in their movement toward centric. In this process some of the bolus will pass lingually where the tongue returns it to the buccal space for repeated masticatory strokes. In bilateral chewing the tongue will pass the whole bolus to the buccal space of the opposite side at frequent intervals (Fig. 1).

Controversial Point—Whether the

lower teeth pass completely through the bolus or not is still a matter of some controversy. Jankelson¹² and his co-workers have shown that the teeth do not meet in mastication except on deglutition. There are so many other factors involved in the distribution of stress to the teeth that this point does not require discussion here.

Bolus Held on Occlusal Table—Generally speaking, the cusp inclines of the upper teeth serve to hold the

¹²Jankelson, B.: Physiology of Human Dental Occlusion, JADA 50:664-689 (June) 1955.



1. The chewing cycle, viewed anteriorly, has a tear-shaped pattern. The food is held by the upper teeth and musculature as the lower teeth tear it in their movement towards centric. A large part of the bolus passes lingually in the process.

¹Begg, P. R.: Stone Age Man's Dentition, Am. J. Orthodont. 40:298-312 (April); 373-383 (May) 462-475 (June) 1954.

²Weinberger, A.: Attritioning of Teeth, Oral Surg., Oral Med., Oral Path. 8:1048-1059 (Oct.) 1955.

³Beyron, H. L.: Occlusal Changes in Adult Dentition, JADA 48:674-686 (June) 1954.

⁴Granger, E. R.: Functional Relations of the Stomatognathic System, JADA 48:638-647 (June) 1954.

⁵Jankelson, B.; Hoffman, G.; and Hendron, J.: The Physiology of the Stomatognathic System, JADA 46:375-486 (April) 1953.

⁶Kurth, L. E.: Balanced Occlusion, J. Pros. Dent. 4:150-167 (March) 1954.

⁷Schuyler, C. H.: The Correction of Occlusal Disharmony of the Natural Dentition, New York J. Dent. 13:545-562 (Oct.) 1947.

⁸Sorrin, Sidney: Traumatic Occlusion, its Detection and Correction, DENTAL DIGEST 40:170-173 (May); 202-208 (June) 1934.

⁹Miller, S. C.: Textbook of Periodontia, ed. 3, Philadelphia, The Blakiston Company, 1950, pp. 343-384.

¹⁰Blass, J. L.: Occlusal Equilibration in Periodontal Treatment, New York J. Dent. 22:121-129 (March) 1956.

¹¹Hilderbrand, G. Y.: Studies in Mandibular Kinematics, D. Cosmos 78:399-458, 1936.

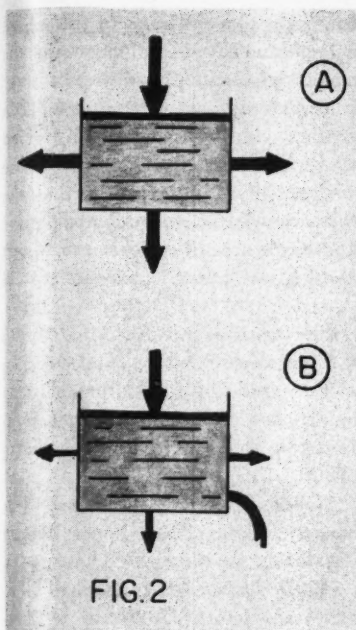


FIG. 2

2. Force on a piston (A) causes equal pressure distributed by the confined fluid to the walls of the container. If some of the fluid escapes (B) the force distributed to the walls of the container will be less depending on the rate of escape of the fluid.

bolus on the occlusal table as the lower teeth tear through. Engineering consultation¹³ supports the idea that the upper lingual cusp incline is important to the efficiency of the system because it helps limit the lingual escaping of the food as a result of the chewing pattern. If there were little resistance to the lingual movement of the food, then little tearing action of the bolus would occur.

Function of the Cusp Inclines—The upper buccal cusp incline serves to hold the food for the tearing of the lower buccal cusp which passes through the bolus (not necessarily to tooth contact). The upper lingual cusp incline helps limit the lingual movement of the bolus as well as to provide an area for the crushing action of the food caught between it and the lower buccal cusp incline as the teeth approach centric. The upper lingual cusp slope and the cusp incline exert a tearing action as the food is moved lingually and pressed against it by the lower lingual cusp.

¹³Weinberg, R. A.: Personal Communication.

Upper Lingual Cusp Remains Static—Essentially the lower buccal cusp tears through the food that is restricted in its movement lingually, whereas the upper lingual cusp remains static as the food is moved lingually against it under pressure.

Abrasion by Food

Understanding of the dynamic relationship of the bolus to the teeth helps explain one of the causes of wear of the teeth observed in the characteristic "anti-Monson" of reversed transverse curve in well-worn occlusion. If the food were abrasive, the lower buccal cusp would wear at a greater rate than the upper buccal cusp. The upper lingual cusp is abraded as the food passes lingually against it under pressure while the lower lingual cusp moves in the same direction as the movement of the food and serves to carry it with less wear.

Abrasion by food would take place on all surfaces but would show a difference in the relative degree. With most "nonabrasive" contemporary diets the rate of wear is slower.

Food Pressure

One of the important factors in the distribution of force to the teeth is the viscosity of the bolus. Even though the lower cusp may not penetrate the bolus there is force distribution through the food to both teeth. The amount of force depends (1) on the cusp angles, (2) the viscosity of the food, and (3) the rate of escape. A review of the law of confined fluids (hydraulic system) shows that a force on the piston distributes the force equally to all the walls of the container through the confined fluid (A, Fig. 2).

Effects of Viscosity—If there is an escape of fluid slowly the total pressure on the walls will diminish. The pressure will remain equal on all the walls but the amount of force will depend on how large the hole is and the viscosity of the fluid. The faster it escapes, the less pressure is exerted on the container walls with the same initial force on the piston (B, Fig. 2).

Variations in Food Resistance—Some foods have little resistance and fall apart with little force exerted by

the teeth. Other more resistant foods such as meat will initially tear and escape lingually and to some degree, be forced toward the buccal.

Increase of Viscosity—As the teeth approach centric, the escape of food lingually (and buccally) diminishes and the viscosity of the bolus begins to rise. When the bolus reaches the limit of flow it acts similarly to the confined fluid and distributes forces perpendicular to the inclines.

Components of Force—The vectors of force are seen in Figure 3 where two vectors go buccally on the upper (A and B) while one vector of force goes lingually (C). On the lower the opposite takes place with two vectors in a lingual direction (A_1 and B_1) and one vector in a buccal direction (C_1). In both cases the lateral effects of one buccal and lingual vector tend to cancel each other out (A and C) and (A_1 and C_1) and the net result is a buccal component of force on the upper and a lingual component of force on the lower.

Development of Lateral Pressure—Even though teeth may not meet in function when certain foods are mas-

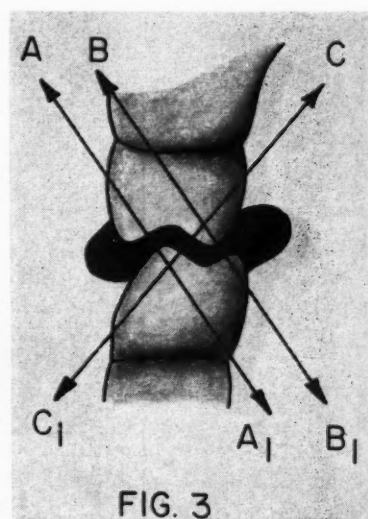


FIG. 3

3. When the bolus reaches the limit of flow it acts similarly to confined fluid and distributes forces perpendicular to the inclines even though the teeth are not in contact. The lateral effects of vectors (A and C) on the upper and (A_1 and C_1) on the lower tend to cancel each other and the net result is a buccal component of force on the upper and a lingual component of force on the lower.

ticated, lateral pressures develop in proportion to the cuspal inclination and the viscosity (degree of flow) of the bolus. The softer the food, the less the lateral pressure.

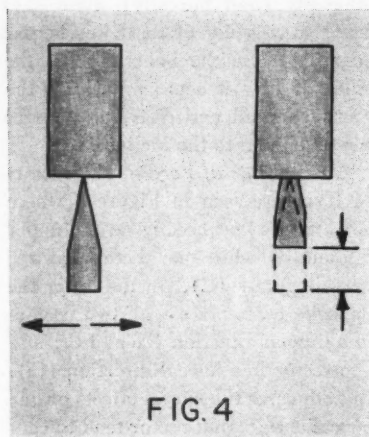


FIG. 4

4. If a wedge is rubbed back and forth on a plane, the point of the wedge begins to flatten with only slight wear on the plane. The point of the wedge is continuously in contact with the plane and constantly subject to wear whereas only a part of the plane is in contact with the wedge at any given time.

Tooth Attrition

Jankelson⁵ suggests that there is a possibility of a difference in resistance of enamel surfaces of the same tooth to abrasion by bruxism or food. Weinberger² points out that some teeth, particularly the yellow shades, seem to be more susceptible to wear.

Wear Pattern can be Produced by Bruxism—The physiologic wear pattern so frequently observed in well-worn occlusions can also be explained by bruxism as well as food abrasion. Examination of a simple physical problem of wear will aid in understanding how bruxism can contribute to the more rapid wear of the lower buccal and the upper lingual cusps than their opposite occluding surfaces.

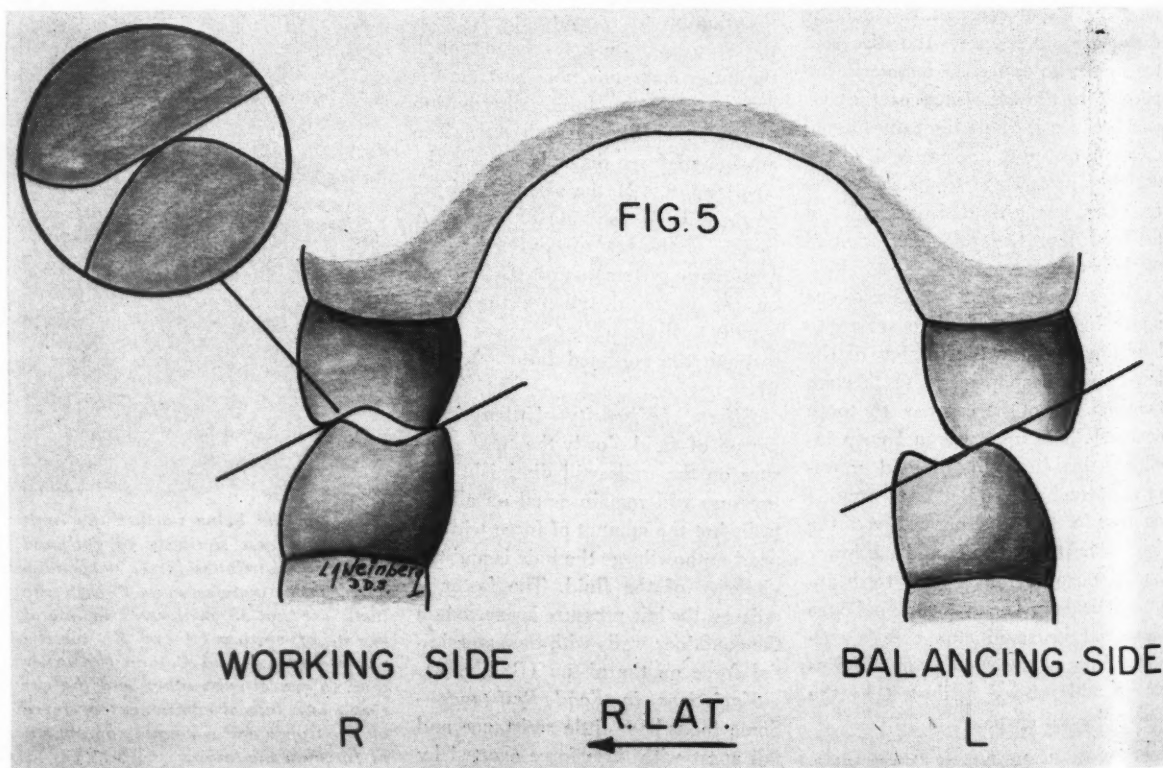
Problem of Wear—If a wedge is rubbed back and forth on a plane surface of equal hardness as shown in Figure 4, the point of the wedge will flatten while the amount of wear on the plane will be slight. The reason

for this is that the point of the wedge is continuously in contact with the plane and constantly subject to wear whereas only part of the plane is in contact with the wedge at any given time. The vertical reduction of the wedge will always be greater than the the plane. As the wedge flattens, more and more area is subject to contact and the rate of vertical reduction will decrease.

Bruxating Movements in the Mouth—In the mouth the upper buccal cusp inclines and the lower lingual cusp inclines act as the plane in lateral (working side) bruxating movements (R, Fig. 5).

Slopes Act as Wedge—The lower buccal slopes and the upper lingual slopes act as the wedge because a rounded surface offers a small contact area. Before the effects of bruxism take place the rounded lower buccal slope contacts the guiding incline plane of the upper buccal cusp (work-

5. During bruxism the guiding inclines of the working side act as the plane and the contacting slopes act as the wedge. A rounded cusp slope offers little contact area as shown in the insert. Balancing side has a plane-to-plane contact.



ing side) as seen in Figure 5. Similarly the rounded upper lingual slope contacts the lower lingual cusp incline in lateral (working side) excursions.

Flattening of Rounded Surfaces—As bruxism takes place, these rounded surfaces begin to flatten, showing the characteristic finely polished facets. The buccal slope of the lower and the lingual slope of the upper will always wear at a greater rate than their contacting surfaces in bruxism because these forming facets are in constant contact while only a part of the guiding inclines are in contact at any given time.

Balancing Side

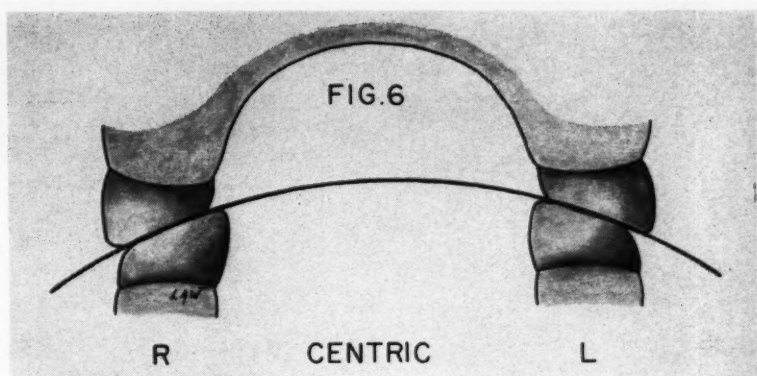
If there is contact on the balancing side during bruxism it would be a plane-to-plane contact as shown in Figure 5 (lower buccal cusp incline with the upper lingual cusp incline). The rate of vertical reduction would tend to be slower on the "balancing side" than on the "working side" initially because each balancing side surface has an area in contact rather than a cusp-to-plane contact. As the rounded surfaces on the working side form facets and widen, the rate of vertical reduction of the working side compared to the balancing side may more closely equal each other.

Bilateral Bruxism

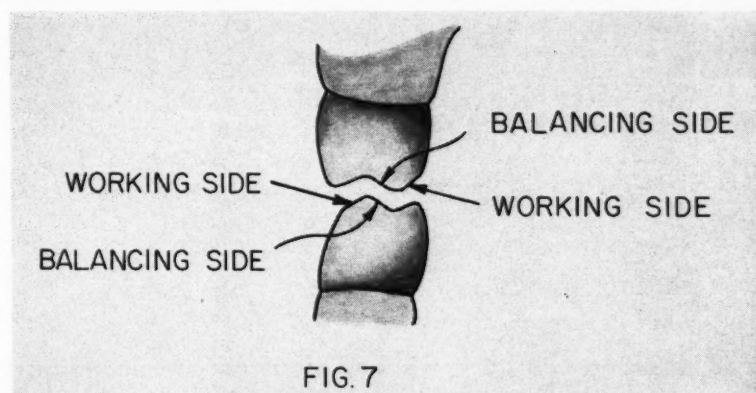
If bilateral bruxism takes place, the upper lingual and the lower buccal cusp will wear at a greater rate than their contacting surfaces thus conforming with the physiological wear pattern observed (Fig. 6). While bruxism takes place on the "working side," the lower buccal slope and the upper lingual slope will wear faster than their guiding inclines (upper buccal cusp incline and the lower lingual cusp incline respectively) due to the "wedge and plane" principle. When that side acts as the "balancing side," the remainder of the cusps, lower buccal cusp incline, and the upper lingual cusp incline wear each other (Fig. 7).

Physiologic Wear Pattern

The physiologic wear pattern in the anti-Monson or reversed curve (Fig. 6) can be explained on the basis of food abrasion and tooth-to-tooth attri-



6. In well-worn occlusions usually the buccal cusp of the lower and the lingual cusp of the upper wear at a greater rate than their contacting surfaces which produces the reversed or anti-Monson curve.



7. Bilateral bruxism can contribute to the observed physiologic wear pattern seen in Figure 6. On the working side the lower buccal and upper lingual slopes wear at a faster rate than their contacting surfaces. When these teeth act as the balancing side the remainder of these cusps (upper lingual and the lower buccal cusp inclines) wear each other.

tion. The lower buccal cusp tearing through abrasive food and the same bolus being pushed past the upper lingual cusp under pressure can explain why these cusps wear faster than their contacting surfaces.

Unequal Wear Accelerated—The more abrasive the food the more the wear: once the dentin is exposed on these surfaces the unequal rate of wear is accelerated even more.

Facet Formation Usually Caused by Bruxism—Bilateral bruxism also may offer an explanation for the faster rate of wear on the lower buccal and the upper lingual cusps. Bruxism usually causes facet formation with highly polished surfaces whereas marked food abrasion has a rounding and smoothing effect. The angula-

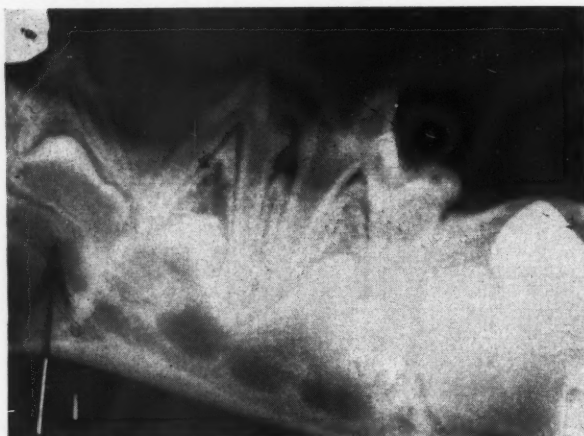
tion of the wear pattern is affected by the temporomandibular joint, the incisal guidance, and the individual habit pattern.

Occlusal Correction

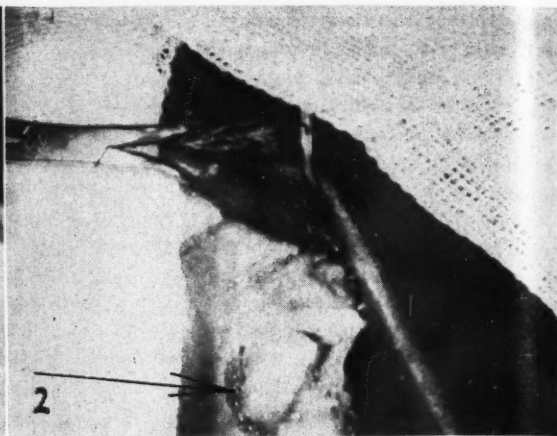
Wear facets *per se* may be a sign of occlusal trauma.¹⁴ Because of the physiological wear pattern as described (Fig. 6), some authors recommend correction by grinding the lower buccal cusp and the upper lingual cusp.^{5,6} It would seem logical that this method of correction would only add to the disproportionate rate of wear between these surfaces and their guiding inclines.

(Continued on page 72)

¹⁴Weinberg, L. A.: Diagnosis of Wear Facets in Occlusal Equilibration, JADA 50:26-36 (Jan.) 1956.



1. The arrow is shown pointing to the tooth germ of a puppy to be transplanted into the socket of an adult dog.



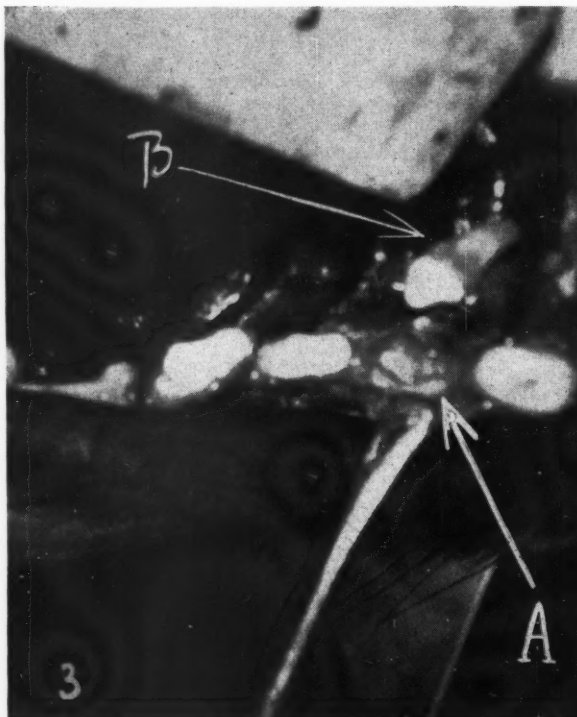
2. The tooth germ shown in Figure one is exposed and ready for transplantation.

TRANSPLANTATION of Toothbuds in Dogs

LEON HERSCHFUS, D.D.S., Detroit

DIGEST

This article reports the results of an experimentation in the transplantation of teeth in dogs. Although his transplantation technique has not as yet been successful, the author is continuing the research problem in the hope that eventually transplantation of



3. Toothbud (A) transplanted into the socket of a freshly extracted tooth (B) in an adult dog.



4. The transplantation shown in Figure 3 after suturing.

teeth in human beings may be undertaken. The steps employed in the transplantation technique in dogs are illustrated.

Classifications of Tissue Transplantation

Transplantation of tissues can be classified in the following categories:

Autologous (transferral of tissues to other regions in the same host)

Homologous (transferral to the same species)

Heterologous (transferral to animals of alien species)

Important Factors in Technique

The following are the most important factors involved in the transplantation of tissues:

1. Constitutional relationship of the donor and recipient
2. Status of the transplant
3. Site of transplantation

Constitutional Factors Involved—

These are generally considered to be genetic in nature.

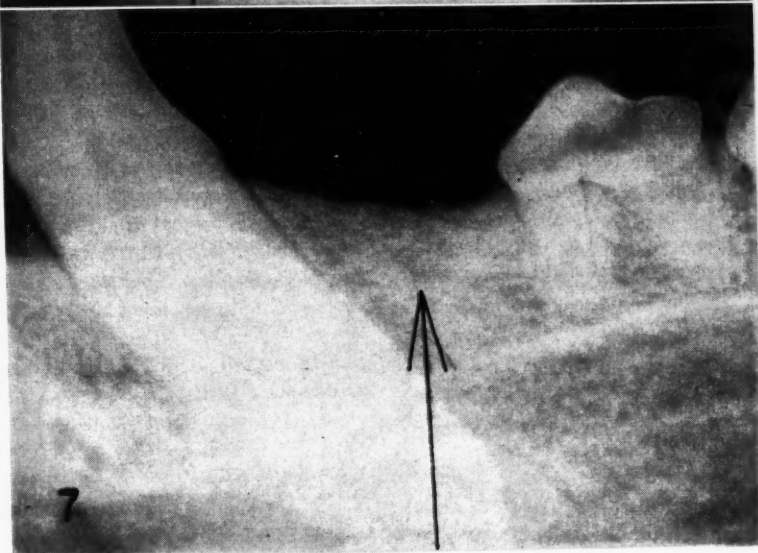
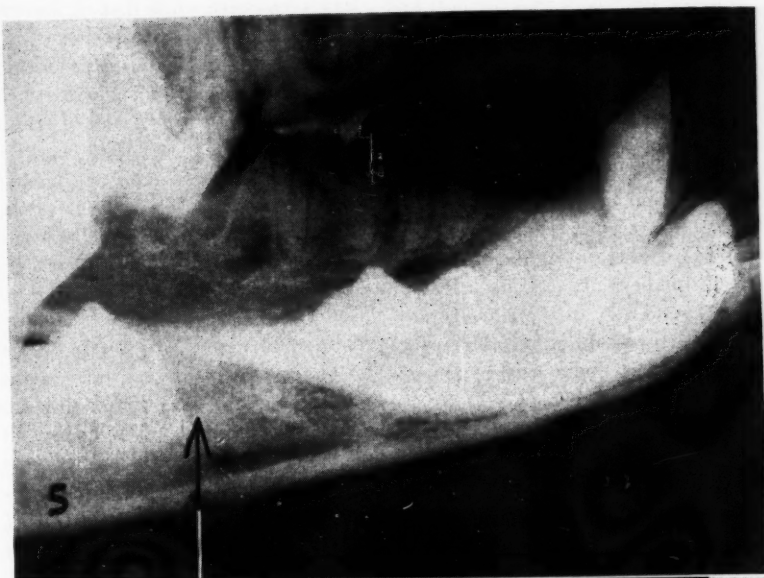
Individuality Differentials: Loeb,¹ one of the foremost investigators in the field of transplantations, raised the question of individuality differentials: "The primary factors determining the fate of transplants are, then, the differences in the individuality differentials of host and transplant, these differentials being preformed and giving rise to relatively slow and mild, but, in many instances, gradually accumulating primary reactions against the transplants. The reactions of the host against the transplant set in as soon as the latter has entered into organic connections with the host and as soon as the individuality differentials have had a chance to diffuse

¹Loeb, Leo: *The Biological Basis of Individuality*, ed. 1. Springfield, Illinois, Charles C Thomas, 1945. p. 161.

5. One month later. The transplant has virtually disappeared.

6. Homogenous transplantation of a tooth germ in the developmental period, before formation of hard tissue shows the same failure in development as that seen in Figure 5.

7. Another case of homogenous transplantation showing the same failure as in the other examples.



from the transplant into the host and here to set in motion a response on the part of the various tissues."

Additional Factors Possible: There is evidence that other factors, of equal importance, may be involved. While many investigators indicate that transplants do not survive because of an immune reaction, the difference in persistence due (1) to the status of a tissue (embryonic, fetal, neonatal, or adult), and (2) to the site of transplantation, encourage reservations in accepting the immunity hypothesis without question.

Status of the Transplant—This is of utmost importance. The dental germ in its development period is an autonomous entity, therefore the most favorable time for transplantation seems to be before formation of the hard tissues takes place or when completion of the crown has occurred with root development still in its early stages. Once the roots are completed, the tooth is connected with the other parts by blood vessels and nerves.

Site Selected for Transplantation Important—In the majority of cases the transfer of tissue from one person to another is associated with death of the stromal component of the graft, and the parenchyma persists only if a connective tissue scaffolding and a vascular supply are furnished by the new host.

Determination of Reaction—The reaction of the new host to the graft in this respect is determined by the stroma-evoking properties of the parenchymal cells on the one hand and by the responsiveness of the connective tissue at the transplantation site on the other.

Possible Stroma Relationship—There seems to be a direct relationship between stroma-inducing ability and the normal stroma complement of the organ from which the cells are derived. The connective tissues in different bodily regions also vary in their responsiveness to the same stroma-inducing stimulus.

Responsiveness of Connective Tissue: The connective tissue of the subcutaneous space, in most species, is

least responsive while that of the iris and brain is highly responsive.

Autonomy in Transfer: Certain transplanted embryonic tissues, such as tooth germs, have a power of autonomy in transfer depending on the site of transfer. The anterior chamber of the eye and brain are the locations of choice for tooth germs. Only one location, however, is under consideration here, the alveolar socket.

Experimentation with Dogs

After a few successful autogenous transplantations, the author has attempted for several years to transplant toothbuds from puppies (embryonic germs and fetal teeth of the permanent dentition (into the sockets of freshly extracted teeth of adult dogs (homogenous transplantations).

Results Unfavorable—So far this experiment has been a total failure. Development and growth did not occur and the buds disappeared as shown by roentgenographic examinations (Figs. 1 to 7). No histologic observations were included but it is hoped to include these in future investigations.

Research Continuing—Research is continuing in this direction using homologous transplants of embryonic toothbuds and developing transplants in which the crown has completely formed and the root development is in its early stages.

Transplantation in Human Beings Foreseen

If teams of skilled and experienced specialists in different fields could direct their efforts toward the solution of many of the unsolved problems connected with transplantation of tissue, the possibility of homologous transplants in man could be foreseen and the establishment of a tooth bank for favorable transplant cases would become a reality. The tooth transplants would be governed by the same rules and be subject to much the same limitations and physiologic conditions as those applied to other tissue transplants.

1201 Cadillac Tower

Impairment of Communication

MAURICE J. BARRY, JR., M.D.

Since in the social group we have become dependent upon one another, and since the fulfillment of this dependence is the function of communication, it is then seen that communication itself has become one of the basic attributes of what we have agreed to call "human." Communication is mediated by the special senses, whether it be by gesture, facial expression, posture or symbol, or whether it be by means of that strange aggregation of grunts, coughs, coos and whistles that we call "verbal language." Save for the finer discriminations of tactile sensibility, all the organs for special sense, taste, sight, olfaction and hearing are located in the regions of the eye, the ear, the nose and the oral cavity. By extension, we may say that all organs for the reception of communication are located in these regions. Verbal speech for the purpose of expressive communication is mediated through the organs of the mouth and throat.

The question should now be raised, "Does disease of these particular areas, through impairment of sensual communication, have special emotional meaning for the patient?" Not only our clinical experience but laboratory studies indicate that impairment of communication has profound emotional meaning for the individual person.

From *Proceedings of the Staff Meetings of the Mayo Clinic* 31: 288 (May 2) 1956.

The CUTTER BAR Technique

WALTER A. BADER, D.D.S., Stockton, California

DIGEST

Prosthetic procedures in dentistry are extremely important and have probably been the object of more intensive research and experimentation than any other branch of dentistry. Material, methods of construction, and tooth design have been improved until modern procedures have little similarity to former techniques. This article describes a nonanatomic segment called a cutter bar, which has been developed to utilize reduced pressure in mastication, for the edentulous patient. Step-by-step directions are given for the application and use of the device.

Early Prosthetic Methods

The early designers of artificial teeth copied minutely every cusp and sulci of the natural dentition in the belief that efficiency of artificial dentures could thus be made comparable to that of natural teeth.

Causes Ignored—The factors causing the edentulous condition were not considered and artificial teeth were chosen to restore certain areas regardless of the condition of the underlying structures, or musculature, or age of the patient. Large, high cusped teeth were placed in jaws involved in periodontal disease or on areas where the cuspal inclination was greater than that of the supporting ridge.

Results Undesirable—The effect of early prosthetic measures was excessive traumatization resulting in loss

of retentive ridges and production of masses of hypertrophic, useless tissue. That a reproduction of normal teeth in denture construction has been a failure, is manifest in the many types of posterior teeth available, many of which bear only a token resemblance to the original form.

Nonanatomic Tooth Forms—If a posterior tooth is not an exact copy of a natural one, it must be considered a nonanatomic tooth form and the necessity for its structure analyzed. Exact duplication of normal teeth fail in artificial dentures (1) because immobilization of opposing factors is of vital importance, and (2) large occlusal areas cannot be tolerated by sensitive soft tissue.

Instrument for Testing Pressure

For many years it was assumed that the edentulous mandible and maxilla could approximate the pressures exerted by the natural dentition. To test this assumption, an instrument called the gnathometer was constructed and over three hundred cases were examined.

Pressure of Natural Teeth—It was found that in the natural dentition two opposing upper and lower molars could exert a pressure of seventy to eighty pounds.

Edentulous Pressure—When the case became edentulous and completely recovered, the pressure in the same area had dropped to ten or fifteen pounds.

Pressure in Pyorrheal Conditions—

When excessive periodontal disease had been the factor making extraction necessary the average pressure had dropped to six pounds in the posterior areas and two to four pounds in the anterior region.

Controlling Factor in Successful Dentures—The degree of sensitivity of the mucous membrane in the mandible is usually the controlling factor in the success or failure of a full upper and lower denture.

Sensitivity Possible Inhibiting Factor—It was noted that the resilient mucofibrous tissue of the maxilla could exert a pressure of forty-five to fifty pounds even after recent extraction. The extreme sensitivity of the mandibular tissue therefore might be considered an inhibiting factor in the traumatizing effect of artificial mastication. A complete degeneration and loss of function of the mandible might otherwise be experienced.

Pressure Tolerance of Supporting Tissue Considered—A method of mastication that will be within the pressure tolerance of the supporting tissues must be provided in each individual case.

Mechanical Substitute for Pressure—The mechanics of the natural dentition provides shearing and comminution with each completed excursion of the working bite. When only 10 per cent of the original pressure remains, some mechanical substitute must be found. The application of an extremely sharp straight edge would require the least pressure in separating foods. If this could be accomplished in the oral cavity, mastication would again be possible for those with limited pressure ability.

Qualifications of Nonanatomic

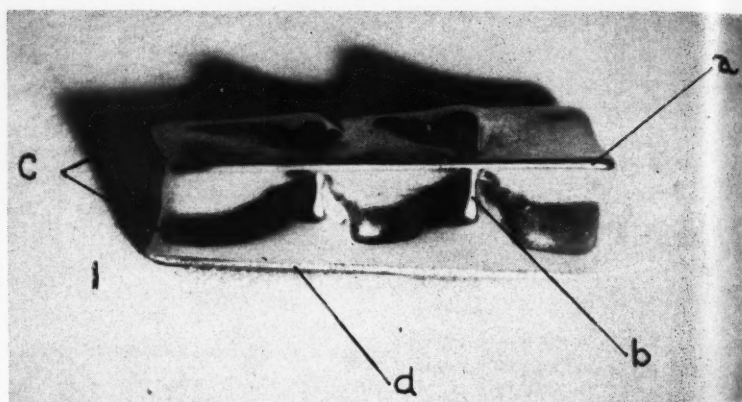
Tooth—The following qualifications are necessary for a nonanatomic tooth:

1. There must be no lateral impingement on subdenture tissue.
2. Food must not be impacted on or around the tooth form.
3. The separated or comminuted food must not be delivered to any area of the mouth not normal to action from the tongue or cheek.
4. The tooth material must not be injurious or incompatible to the surrounding tissue.
5. Mastication must be accomplished with the least possible pressure.
6. Ease of cleansing is an important factor.

Cutter Bar Developed

A nonanatomic segment called the cutter bar has been developed which incorporates all the requirements of a nonanatomic tooth to a considerable degree. While some patients objected to its esthetics, the desire to masticate thoroughly usually predominated.

Description—The narrow cutting edge as in (a) of Figure 1 provides for the maximum efficiency of food separation, but requires a greater frequency of closures. The sum total of



1. The cutter bar.

the pressure, however, is less than when the impossibly wide occlusal table of ordinary artificial teeth is used. The slight lateral projections (b) prevent injury to tongue or cheek. The cutter bar is narrowed mesially and widened distally (c) to conform to its position in the dentures. Segment is grooved for a finish line (d).

Comparative Pressures Shown—In the following table the pressures required with natural or artificial teeth are compared with those required using the cutter bar:

TABLE I

Foods	Pressure in Pounds With Natural and Artificial Mastication	Pressure in Pounds With the Cutter Bar
BACON (crisp)	45	6-7
BEEF STEAK	40-50	7-9
BREAD (crust)	20-30	2-3
CABBAGE (raw)	36	5
CHIPPED BEEF	45-50	9
CELERY (raw)	20	3-4
CARROT (raw)	25	5-10
CHICKEN	38	4
CORNER BEEF	20-30	3-4
LAMB (chops)	20-30	5-6
LIVER	15-20	4-5
NUTS	20-30	5
VEAL (roast)	30	4-6
(chops)	45	6-8
LETTUCE	25	3
SALTED ALMONDS	45-55	5
TURKEY (white meat)	38	4
TOAST	30-35	5
PORK (roast)	15	3
(chops)	20	4

Procedure Used in Application of Bar

The area found to be most efficient for the insertion of the cutter bar is the second bicuspid and first molar region of the denture. The insertion may be made in the upper denture when the patient expresses difficulty in masticating small particles.

Installing the Cutter Bar in a Lower Denture—If the gnathometer shows an exceptionally low reading or if a gnathometer is not available and the patient demonstrates excessively tender supporting tissue, the bars may be inserted bilaterally. It is assumed that bite-blocks have been prepared and mounted on the articulator of choice. The straight line articulator with the cutter bar technique has produced satisfactory results.

Method—1. The three upper and lower anterior teeth of one side are mounted.

2. The two upper bicuspid are ground flat occlusally and the contacts reduced to form a solid unit.

3. The lower first molar will be replaced with the cutter bar and is used in the upper denture because it provides a wider occlusal table. This molar and the upper first molar are flattened with the contacts also reduced and waxed in position.

4. The four teeth are closely approximated and conformed to the surface of the lower bite-block (Fig. 3).

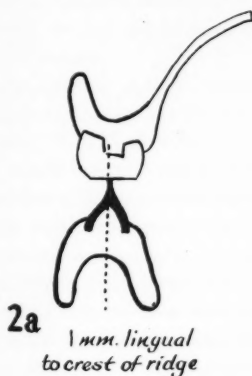
5. The lower first bicuspid is ground flat and the contact reduced



2. Flattened occlusal table.



3. The cutter bar in position in the denture.



2a. Position of the cutter bar relative to the occlusal table and ridge.

enough to conform to the mesial of the cutter bar.

6. The cutter bar is inserted to come in contact with the upper flattened surface in the center, buccolingually. The cutter bar should be placed about 1 millimeter lingually to the lower ridge (Fig. 2a). This adds to the stability of the lower denture.

7. The regular second molar is also flattened and contact is reduced to engage the distal of the cutter bar. The projection of the upper teeth beyond the edge of the cutter bar prevents injury to cheek or tongue.

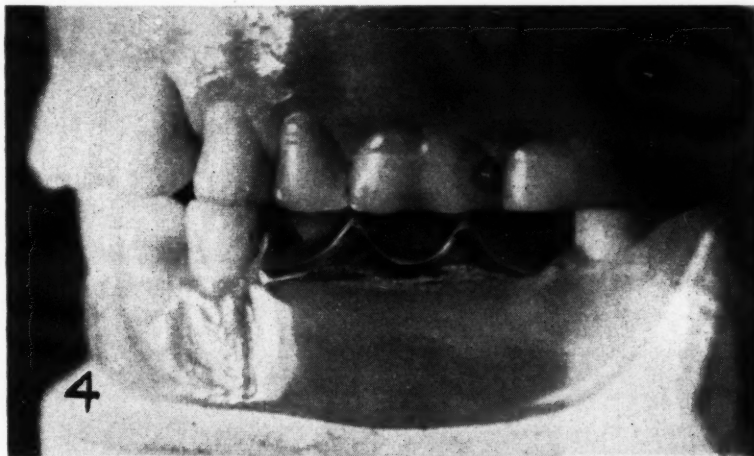
Tissue Injury Prevented—The sharp

buccal edge must be reduced or tearing of the cheek will result. The abutting edges of the first bicuspid and second molar must also be ground (Fig. 3). In cases presenting extremely sensitive ridges, the lateral wings of the cutter bar may be ground away increasing the cutting efficiency. This presents no difficulty as the patient will not be able to injure cheek or tongue. The cutter bar may be incorporated in the House technique, grinding the cutter bar to conform to all positions.

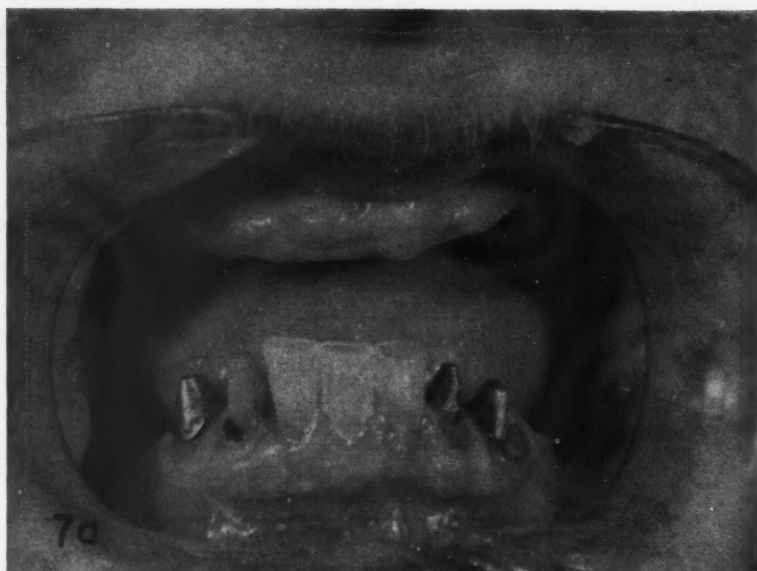
Summary

In more than three hundred cases the use of the cutter bar resulted in increased ability to masticate in all but three cases. One patient was unable to tolerate the sensation of the metallic segment. The remaining two could detect no tactile difference but objected to its appearance. In no case has the use of this nonanatomic segment resulted in any damage to the oral tissue and in all remaining cases the results were intensely gratifying.

210 Bank of America Building



4. The cutter bar in relation to the upper denture.



FULL COVERAGE

As an Approach to Oral

Rehabilitation

-Part Two

VICTOR N. JAFFE, D.D.S.,
Washington, D.C.

DIGEST

In this second installment of a two-part article on the subject of oral reconstruction, the author discusses some of the special factors involved in rehabilitation techniques and in particular describes the segmental approach to completion.

Special Considerations

(1) Before starting on any extensive restorative preparation it is advisable to inform the patient of the hazard of exposure or death of the pulp, with the full understanding that should such be the case, root canal therapy will be instituted and will be the patient's economic responsibility. The efficacy and longevity of modern endodontic procedures are demonstrated and there should be no qualms about using such a root as an abutment.⁶ Technically it has been found advan-

⁶Kaplan, Harry, and Milobsky, Louis: Endodontics and Periradicular Surgery, J. Dist. Col. D. Soc. 28:2:10, p. 43 (March) 1953, pp. 2-11 (May) 1953.

7A. Pulpless teeth are restored with gold posts and cores cemented individually.

7B. Double abutments are used to achieve strength through splinting. An internal attachment denture is constructed with lingual inset arms.

7C. The completed mandibular restorations.

tageous in the case of a nonvital abutment to sublevel the root with the gingiva and directly wax and cast a post which is individually cemented and on which the crown may be constructed treating the restoration as though it were a new preparation.

(2) Be sure the gingival shoulder in anterior teeth is prepared under the gingiva sufficiently not to show the gold of the veneer.

(3) Always examine and relieve the opposing occlusion before starting the preparation. The patient will not be satisfied with fitting "his teeth to your bridge" on insertion.

(4) Abutments as well as individual preparations should be treated with silver nitrate routinely,⁷ unless the esthetic quality should be affected by this procedure.

(5) Be sure to remove enough of the tooth labially so that the finished restoration will not be bulky.

(6) Remember the bone retention factor, using multiple abutments wherever possible.

Operator's Attitude

Why do some operators seem to do much more involved rehabilitation than do others? To repeat: it is not just plain "luck." Luck may be defined as "opportunity in action." The dental situation must be presented for the patient's consideration. This fact will be recognized by any dentist who approaches the subject logically. Rarely, if ever, does a patient ask for complicated dental technique. On the contrary, it is natural for him to try to get by with the least possible discomfort and expense. If the dentist is confident that he can provide a better, cosmetic, more lasting restoration, it is relatively easy to convey his confidence to the patient.

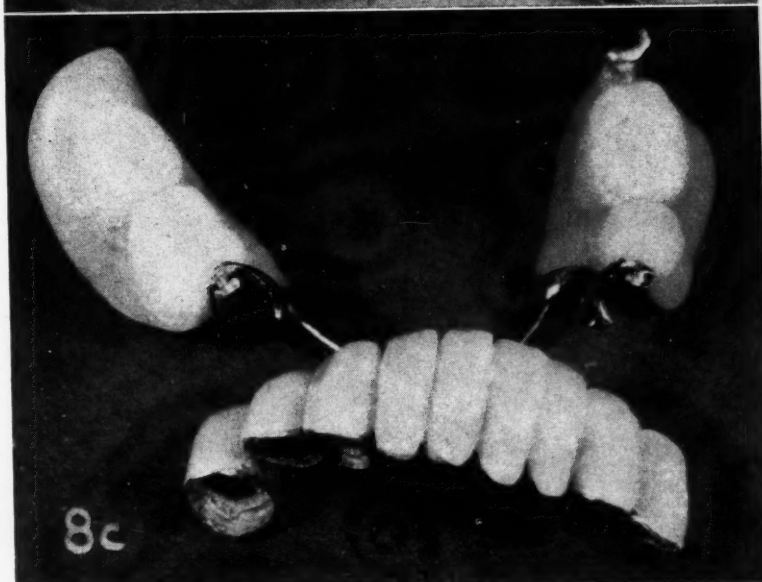
Types of Prostheses Preferred—To approach oral rehabilitation the dentist must believe firmly in the desir-

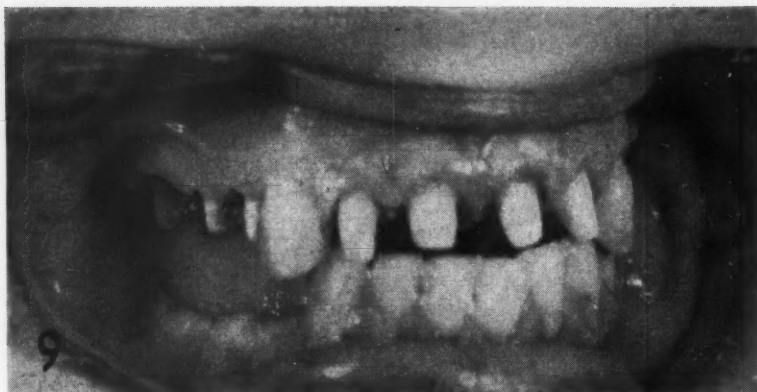
⁷O'Keefe, John: Personal Communication.

3A. Multiple abutment preparations.

3B. Cast metal transfer copings.

3C. The anterior section is joined and strengthened through the use of pontics in a fixed partial denture and the posterior teeth are supplied by a removable partial denture.





9. The maintenance of the maxillomandibular relationship and the centric occlusion by the use of "key" stops.

ability of fixed partial prostheses wherever possible even in unilateral conditions⁸ and in the use of full coverage as being preferable. He should understand that a partial denture with precision type attachments and lingual recessed arms^{9, 10, 11} is advisable only where abutment teeth are badly broken down, rotated, or where there is a negative bone factor¹² so that they must be splinted to the adjacent tooth or teeth using full coverage (Figs. 7 and 8).

Problem of Retention and Esthetics—Bilateral distal extension partial dentures should be made with cast bars and clasps where the remaining teeth have a positive bone factor ex-

⁸Simpson, Richard L.: Failures in Crown and Bridge Prostheses, *JADA* 42:154-159 (Aug.) 1953.

⁹Schuyler, Clyde H.: An Analysis of the Use and Relative Value of the Precision Attachment and the Clasp in Partial Denture Planning, *J. Pros. Dent.* 3:711-714 (Sept.) 1953.

¹⁰Grosser, David: The Dynamics of Internal Precision Attachments, *J. Pros. Dent.* 3:393-401 (May) 1953.

¹¹Leff, Alexander: Precision Attachment Dentures, *J. Pros. Dent.* 2:44-91 (Jan.) 1952.

¹²Grubb, H. D.: Partial Dentures with Precision Attachments, *JADA* 42:154-162 (Feb.) 1951.

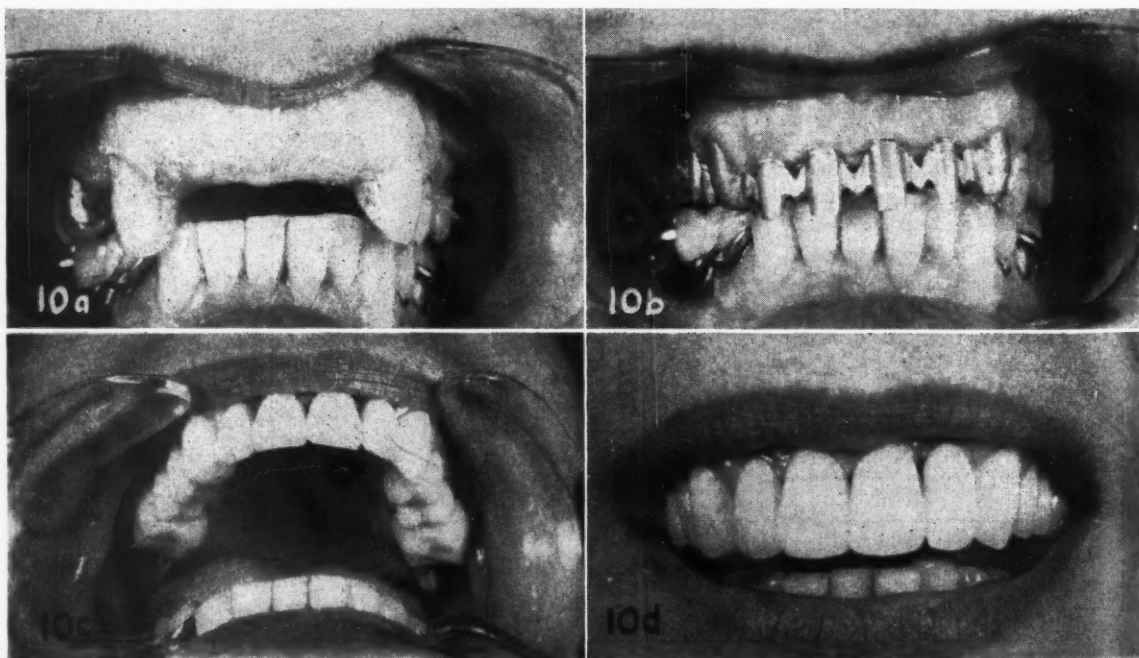
cept in the case of only six remaining anteriors. These usually present a retention as well as an esthetic problem and a precision type case should be considered.

Full Coverage Indicated—Where the abutment bone factor is positive but when the abutment tooth itself is rotated, carious, or unsightly, full coverage is indicated before the construction of a cast-type partial, and such conventional cases on porcelain jacketed or veneered abutments are often constructed.

Segmental Approach

In agreement with Brecker¹³ it is emphasized that the generalized concept of oral rehabilitation, that of undertaking a complete maxillary or mandibular arch at a time, usually may be altered to have the completion as a goal, while its approach, execution, and presentation are completed sectionally. The economic problem presented to the patient when there is insistence on completion of the whole arch at once cannot be ignored. Furthermore, there is the time factor

¹³Brecker, S. Charles: Practical Approach to Extensive Restorative Dentistry, *J. Pros. Dent.* 4:813-832 (Nov.) 1954.



10. (A, B, C, D) A maxillary unit-built porcelain and gold reconstruction accomplished by segmental approach.

for both the operator and the patient. It may be more desirable to spread the work as well as the expense as long as esthetics and functional occlusal balance remain unimpaired (Fig. 9).

Balance Obtained Directly—By completing arches sectionally, balance may be accomplished directly as in the case of periodontic occlusal alteration of cusps and sulci.¹⁴ No elaborate articulator is required.

Use of Temporary Splints—In the

¹⁴Shore, Nathaniel: Equilibration of the Occlusion of the Natural Dentition, JADA 44:414 (April) 1952.

case of "bite correction" erroneously termed "bite raising," a temporary splint may be constructed first bilaterally, and then partially, and wholly discarded as the case progresses. These splints can be overlays of plastic, gold, or coin silver cemented over unground teeth, or may be removable with clasps in the case of a distal extension.

Reconstruction Completed in Segments—These finished segments can be carefully balanced directly in the mouth, guided by the remaining oc-

clusal surfaces and cusps (Fig. 10). These fixed segments may be permanently cemented to place if splinting is not desired, or may be temporarily set to be later joined together as the whole arch is completed.

Introduction of Self-activating Acrylics—The ability to work with segments for later splinting has developed with the introduction and use of the self-activating acrylic resins directly formed in the patient's mouth. It is now possible to construct a full coverage shoulder type abutment bridge anteriorly or posteriorly, take an alginate impression of it while it is in place, remove it, and then reproduce it directly in the mouth in self-activating acrylic to be temporarily worn until the other bridges or crowns are constructed.

(Continued on page 72)

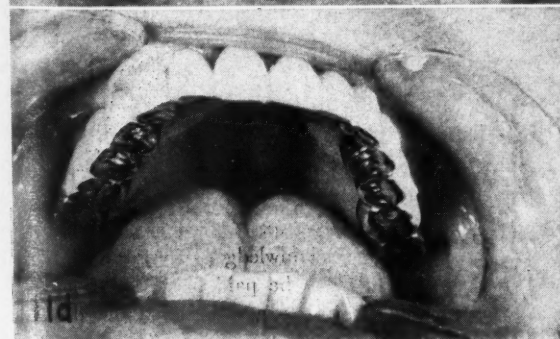
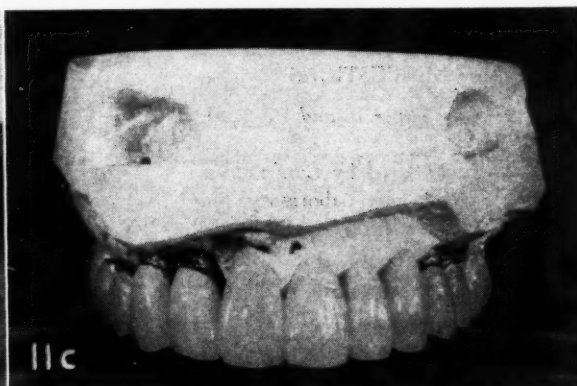


11A. The abutment preparations are treated with silver nitrate prior to cementing a fourteen-unit maxillary restoration.

11B. The anterior segment is constructed first.

11C. Completely assembled upper restoration.

11D and 11E. The completed maxillary restoration.



Temporary Veneers Brushed on— The veneers of the segments need not be cured until the final assemblage, because temporary veneers may be “brushed on” prior to the taking of the alginate impression. Through the use of plaster matrixes, the units may be assembled by soldering to produce a final splinted prosthesis (Fig. 11).

Commentary

One more caution on the manner of approaching oral rehabilitation: the technique must be recognized not just as “good dentistry,” but as advanced dental procedure requiring patience,

perseverance, and understanding. If dentistry is regarded only as a means of livelihood and if the justifiable increased financial return attendant to oral rehabilitation appears as a temptation, the dentist will be disillusioned. Long before the final completion of only one arch will come the realization that if this procedure were divided sectionally in different mouths the economic return would be essentially the same. Success in this field requires clinical research and practice at what might be considered charity fees, not just once, but again and again until full confidence and complete control

of skill and diagnostic aptitude is gained.

With the establishment of confidence and enthusiasm it is obvious that the dentist must present the possibilities in oral rehabilitation to the patient for his consideration, and he is duty bound to explain that such therapy is available. It is a mistake to underestimate the patient's interest or his desire for oral rehabilitation.¹⁵

1314 18th Street, N. W.

¹⁵Gill, S. Raymond: Treatment Planning for Mouth Rehabilitation, J. Pros. Dent. 2:230-245 (March) 1952.

Force Distribution in Mastication, Clenching, and Bruxism

(Continued from page 61)

Possible Results from Removal of Centric Contact—If the centric contact was removed, as in natural dentition, the teeth could elevate or tip, reproducing the trauma. Prosthetic appliances would become more inefficient in the “corrected” areas because

of the reduction in centric contact.

Correction of Acute Angulation— The etiology of the occlusal trauma in eccentric movements is the more acute angulation of the guiding inclines which should be corrected (upper buccal and lower lingual cusp inclines).

7, 8, 9, 10, 15, 16

(End First Installment)

515 Ocean Avenue

¹⁶Weinberg, L. A.: A Visualized Technique of Occlusal Equilibration, J. Dent. Med. 7:9-15; 18-26 (Jan.) 1952.

¹⁵Weinberg, L. A.: A Visualized Technique for Equilibration of Atypical Occlusal Relationships, Oral Surg., Oral Med., and Oral Path. 9:516-528 (May) 1956.

CLINICAL AND LABORATORY SUGGESTIONS

(See pages 76 and 77)

Form to be Used by Contributors
To: Clinical and Laboratory Sug-
gestions Editor

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Sketch:

Explanation of Procedure:

Suggestions submitted cannot be
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\$10 will be paid on publication for
each suggestion that is used.

The EDITOR'S Page

HEALTH is more than the absence of disease. It is a positive force that is manifest by vigor, interest, and social adaptability. Although the dentist should not presume to treat diseases that occur outside the field of his special training and interest he can be an important factor in general health education. As society becomes more complex there are an increasing number of vectors of disease. Our crops are sprayed with deadly chemical agents, our livestock are subject to the introduction of extraneous hormones, our own bodies are exposed to noxious fumes, chemical additives, and the "wonder" drugs. In the atmosphere there is dangerous radiation fallout from experiments with nuclear weapons. The air we breathe, the food we eat, the water we drink are polluted with lethal chemicals. How long the organism can stand up under such assaults is of concern to everyone with any biologic orientation.

Automation will release man from some of his drudgery. He will have more money and more leisure. This combination may bring forth additional diseases that come from a sedentary life and overnutrition.

As the complexity of society becomes more dangerous to our well-being, mankind will need all the help that is available to advance health education. The dentist is in a remarkably favorable position to indoctrinate his patients in the fundamentals of physiology. In a nation that spends billions of dollars for the instruments of military defense there is a mere pittance spent to educate people in the facts of defense against disease.

Although our science has made advance in the conquest of the infectious diseases, the diseases of degeneration are destroying our people in increasing numbers. Every vital statistic indicates that the cardiovascular diseases and cancer are invading the younger age groups and are destroying more people in every age group.

The lead article in a recent issue of the *Journal of the American Medical Association* shows the relationship between faulty health habits and heart disease.¹ Too much food, too much weight, too little exercise are three deadly factors that lead to coronary disease, the "disease of prosperity."

The author of the article (E. P. Luongo) com-

¹Luongo, Edward P.: Health Habits and Heart Disease—Challenge in Preventive Medicine, *JAMA* 162:1023 (Nov. 10) 1956.

ments: "There is evidence that sedentary living and poor health habits are the real culprits in coronary disease and not hard work, overexercise, or occupational stress. The disease incidence does not appear to be governed by occupational titles but more by what exercise an individual gets on or off the job and what his nutritional status has been 10 or 15 years prior to his fourth or fifth decade in life. It appears that insofar as proper health habits (including nutrition and exercise) are concerned, individuals should start training for middle and old age during their youth or childhood. Equally important, every individual should carry on these patterns of nutrition and exercise, within the realm of common sense, as long as possible in middle and old age. This may be difficult because of stresses, cultural problems, and economic situations later in life.

"This study and others are reemphasizing the need for continuing research on nutrition as it relates to chemopathology and molecular disease. In this connection we have no positive criteria for prescribing diets for the prevention of atherosclerosis. While the work being done on the relationship of fatty acids to blood lipids seems to open up avenues for research that may be productive of certain criteria, we find that the safest and most practical dietary advice is to 'cut down' and not 'cut out' and to encourage a variety of food in the diet with a restriction on unwarranted or excessive use of total fat. This would not apply, of course, to those with excessive amounts of cholesterol in their blood. To our best knowledge today, these candidates for coronary disease should become vegetarians.

"We can add further longevity and, more important, breadth and depth to man's existence by thinking more in terms of positive health measures and by inculcating into our philosophy of medicine a new definition of health—one that is independent of the word disease and one that stresses good physical and mental health habits early in life that can be productive of better mental and physical efficiency in middle and old age. We must exert a continual alertness for new cultural problems with new habits, excesses, deficiencies, stresses, and strains that can rob us of our victory over the infectious diseases by taking lives of those recently saved from curable and preventable infectious diseases."

Clinical Methods

of HYPNOTIC INDUCTION

ROBERT A. ATTERBURY, B.S., D.D.S., Oak Park, Illinois

DIGEST

Despite increasing interest in the phenomenon of hypnosis, its nature is still incompletely understood. This article analyzes various definitions of hypnosis, classifies the stages of depth of the hypnotic condition as it may be applied in dentistry, and describes a number of clinical methods of induction.

Definitions

Hypnosis was formerly thought to be a state where the patient's personality was nullified and his behavior was automatic. It was also believed that because the patient became subject to the operator's commands his personality eventually deteriorated while the operator gained force. Other opinions suggest that hypnotic behavior is meaningful, goal-directed striving, its specific objective being to behave in the manner of a hypnotized person as it is defined by the operator and understood by the subject. By this definition the subject is a human being who hears, feels, understands, and follows directions. Another concept is that the hypnotic state is the result of intense concentration by the subject on the suggested ideas and actions of the operator to the degree that these ideas and actions are transmitted to the subject's motor and autonomic expressions.

Dental Applications

As the resistance of the subject begins to waver, his attention is focused

on the operator to the exclusion of all other stimuli. This is an unconscious process arrived at gradually in the first visit and attained more rapidly in subsequent inductions. The establishment of this state of concentration is one of the essential differences between artificially induced and natural sleep.

Some Causes of Resistance—When resistance to suggestion is built up instead of lessened, future inductions are not successful. Resistance may be due to a variety of unfavorable elements including a negative personality of the operator, improper choice of words, or unfavorable environment.

Ways to Overcome Resistance — Suggestion resistance can sometimes be overcome by impersonal suggestions repeated on phonograph recordings or by the monotonous sound of a metronome.

Classification of Hypnotic Depth

A number of stages and depths are induced in the subject as he leaves the waking state. The following are some of the classifications of hypnotic depth:

Waking Hypnotic Stage—The subject is fully awake in this stage, but in a manner difficult to explain. He becomes obedient to the operator's suggestion. It is possible that the mental process of the subject is less forceful than the operator's so that his negligible resistance is overcome by the positive command of the operator until he yields and gives subjective

obedience. An example is the unquestioning obedience of a child to his parents, especially among Oriental people where family ties are indestructible.

Hypnoidal or Drowsiness Stage — The subject begins to become sleepy, eyelids become heavy, eyes become watery, and the subject offers a final waking resistance. The eyelids close, but still quiver and may open occasionally. The subject is conscious of all that the operator suggests but all other sounds and stimuli seem to remain at a distance. The depth of this stage depends upon the speed of induction and environmental conditions.

Light Hypnotic Stage—The eyelids shut tight with occasional fluttering. Hypnotic tests are positive. The patient is still conscious, but gradually wanes to a light sleep. This is an ideal stage for dental procedures. This is also the stage in which psychoanalysis may be undertaken and criminal confessions (hypnoanalysis) are possible.

Somnambulistic Stage—Anesthesia for minor surgery could be achieved in this stage. This is the stage where posthypnotic suggestions become deeply embedded in the subject's unconscious enabling him to execute them long after the hypnosis is completed. In this state the subject becomes dependent upon the operator's command.

Cataleptic Stage—This is the deepest hypnotic phase in which the subject's condition resembles muscular rigidity. The autonomic system is markedly influenced during this stage of hypnosis. It must, therefore, be emphasized that because of the hazards associated with hypnosis in its deepest stage, the cataleptic pheno-

menon should be induced only by experts who understand human psychology and physiology and should not be confused with stage hypnotism.

Clinical Methods of Induction

As there is no single induction procedure for any given patient, the following review of some clinical methods of induction may be of value.

Factor Common to all Methods—It must be remembered that in all these methods the reduction of sensory impressions is a permanent consideration. Environmental conditions, therefore, should be of the most conducive kind: silence, monotony of the operator's voice, and dimness of light. All the extrinsic as well as intrinsic stimuli are reduced and only one approach is clear cut: that of the operator.

Fascination Method —The patient is made to look at a specially devised object steadily until the eyelids become tired and the eyes begin to tear. At this point the repeated suggestion that the eyelids are becoming heavy creates the actual sensation in the patient and he has no choice but to close his eyes.

The object of concentration should be placed a little higher than the eye level. This facilitates induction as the eye muscle becomes easily fatigued.

Pen-Light Method—A small flashlight is held before the patient's eyes. He is asked to look at it for a few minutes. He is then told to close his eyes and reproject the light image. At this point a suggestion is made that he is seeing a yellowish bright spot as the eyes close and that this spot is turning red. When the patient begins to follow the change in color of the spot, he will arrive at a state where any color suggestion will be perceived. The patient has now reached the induction state.

Imagination Method—The operator should be creative. The description of a peaceful scene such as the rolling of waves on the seashore, the floating of the clouds in the sky, or the last rays of a setting sun viewed from a valley or a mountain top usually pro-

duces a euphoric state in the subject.

Inner Visualization—As the patient closes his eyes an X in the center of a circle in the middle of a blackboard is suggested. It is then suggested that the X is erased and changed to the letter A, then to B. As the patient's imagination follows the change of letters inside the circle, his waking resistance subsides and his unconscious dominates.

Additional Methods—Other induction methods are: (1) the breathing suggestion method, (2) the ring suspension, (3) Bell's phenomenon technique (the physiologic phenomenon assumed by the eyeballs while asleep and during induction depending upon the easy fatigability of the eye muscles), and (4) the relaxation method.

Later Techniques —Newer techniques that have been developed in a more precise and standardized manner are the phonograph record or recording method which is especially effective in posthypnotic suggestions, the metronome method, whirling disc technique, hour-glass technique, pendulum or locket method, and the spinning top method used in children's induction.

Posthypnotic Suggestions Useful—It should be remembered that when a patient enters hypnosis it will be easier to induce subsequent hypnosis if posthypnotic suggestion has been given.

Comment

It is hoped that this article will serve to stimulate interest in the practice of dental psychosomatics. This article will be of greater interest to the dentist who is unaware of the potentialities of psychosomatics than to the one who already has a working knowledge of the techniques and principles involved.

Dental psychosomatics should be an adjunct in the dentist's armamentarium.

The phenomenon of hypnosis possesses a potentiality which when used by the informed medical and dental practitioner will benefit many patients.

1011 Lake Street

Hypnosis May Solve Some Anesthetic Problems

THREE researchers, Harold B. Crasilneck, Ph.D., James McCranie, M.D., and M. T. Jenkins, M.D., of Dallas, Texas, report in the *Journal of the American Medical Association* the use of hypnosis in several unusual cases:

(1) For the delivery of a baby in a woman suffering polio.

(2) In general dental procedures lasting about two hours each in a woman who developed acute allergy to general anesthesia.

(3) For brain surgery in a 14-year-old girl who suffered epileptic convulsions after a head injury. Necessary electric wave-pattern tests of the brain during surgery which might have been distorted by anesthesia were possible with hypnosis without interference with the tests.

(4) In a man increasingly fearful of anesthesia after numerous changes of dressings and other procedures for severe burns. Extensive procedure was completed under hypnosis without pain for the patient.

(5) Pelvic examination of a woman with an emotional block. Severe heart disease ruled out anesthesia in this case.

Disadvantages—(1) Many persons cannot be hypnotized. (2) The procedure may be time consuming. (3) Special training and skill are required for the hypnotist. (4) The possibility of risk in hypnotizing persons who have psychologic problems.

Adapted from *News Release* from the American Medical Association, (December 28) 1956.



Clinical and Laboratory Suggestions

A Heat Shield for a Carbon-point Solder Instrument

L. V. Downing, D.D.S., Minneapolis, Minnesota

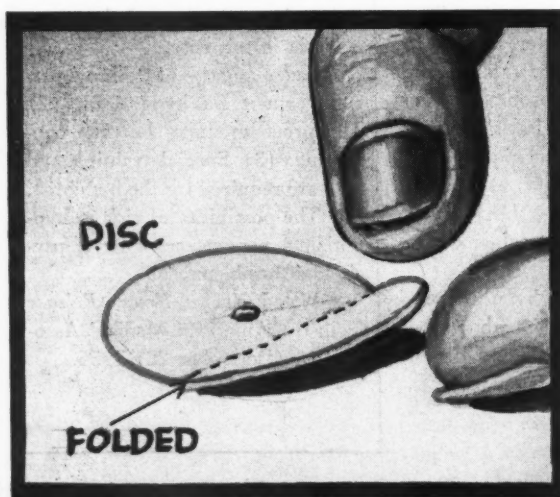
1. Wrap a layer of asbestos around the handle of the solder instrument. This acts as a heat shield to the fingers and also prevents breakage of the carbon-point.



Extraction of Deciduous Teeth

Richard Schneider, D.D.S., Boston

2. A ball of cotton placed in the forceps acts as a stop to catch extracted deciduous teeth.



Used Paper Discs

Frank Lee, D.D.S., Portland, Oregon

3. If a paper disc is bent before it is discarded it is easier to pick up for disposal.

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SUGGESTIONS . . .

A Handle for a Copper Band

Captain W. R. Cook, (DC) USAH, Barstow, California

4. Select heavy baseplate and cut a circle somewhat larger than the copper band. Heat the band and embed it in the baseplate. This makes an excellent handle to use when manipulating the copper band and prevents cutting the fingers.

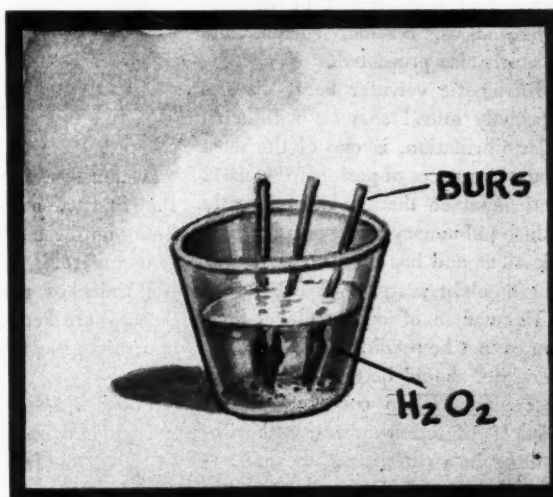


4

Removal of Debris from Stones and Burs

Donald D. Fleckenstein, D.D.S., Colby, Kansas

5. Use a solution of hydrogen peroxide to remove debris from burs and stones before they are cleaned with a brush and sterilized.

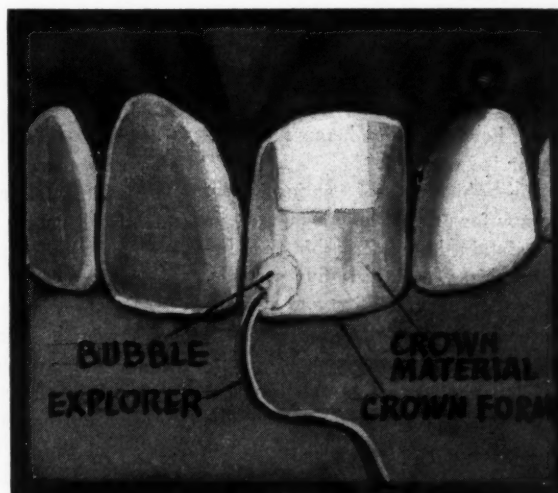


5

Removing Air Bubbles from a Temporary Crown

Floyd J. Southard, D.D.S., Kernersville, North Carolina

6. To eliminate an air bubble in a celluloid or acrylic crown, puncture the void with an explorer. When further pressure is applied, the air bubble is replaced with the acrylic material.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 72 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.



Anticoagulants in Geriatrics

In patients over 50 years of age, thrombosis and embolism cause disability and death more frequently than any other disease. Anticoagulants have, therefore, been used for treatment of most types of intravascular thrombosis and for phlebitis and pulmonary embolism.

Heparin and dicumarol are of great value for pulmonary embolism and thrombophlebitis. Immediate administration of heparin stops propagation and allows contraction of the clot. Subsequent therapy with oral anticoagulants prevents formation of new thrombi. Damage to deep venous valves and development of varicose veins, stasis, eczema, edema, and ulcers is also prevented.

Rheumatic valvular heart disease, especially mitral stenosis with auricular fibrillation, is one of the most frequent sources of peripheral emboli. Anticoagulant therapy may greatly reduce pulmonary and systemic complications and has been continued as long as eight years.

The course of myocardial infarction cannot be predicted. All patients, therefore, should be treated with anticoagulants if no contraindications exist. If infarction appears to be impending in a patient with severe angina, long-term dicumarol therapy may prevent coronary thrombosis.

Most cerebral vascular accidents are a result of thrombosis or embolism. If diagnosis of embolism or thrombosis is reasonably certain, anticoagulants may be expected to be of benefit. Anticoagulants should not be given, however, when hemorrhage exists or is suspected.

The objective of anticoagulant therapy for cerebrovascular disease is to maintain the prothrombin time between thirty and thirty-five seconds, especially during the first two or three weeks. If the first of the daily Quick prothrombin determinations is normal (that is, twelve to thirteen seconds) or less, 300 milligrams of dicumarol are given orally. Heparin, 10,000 to 15,000 units, is given in-

M E D I C I N E

and the Biologic Sciences



travenously every four hours during the first twenty-four to forty-eight hours until the effect of the first dose of dicumarol is manifested. Prothrombin times of patients on long-term therapy are kept between twenty-two and thirty seconds.

Foley, William T.: *The Use of Anticoagulants in Geriatrics*, *Geriatrics* 10:299-305 (June) 1955.



Common Cold

Usually the cold is defined as an acute infection of the upper respiratory tract. It is gradual in onset and probably caused by a filtrable virus. The nose and throat are affected most frequently. Mucous membranes of the eyes and paranasal sinuses may also be involved.

Almost everyone has one or two colds yearly. There are serious economic and medical consequences resulting from the common cold. Large sums of money are spent for worthless medicines and preventive methods.

The cold is important from a med-

ical standpoint because other diseases, such as (1) sinusitis, (2) otitis media, (3) bronchitis, and (4) pneumonia may be sequelae. Also, in the early stages, poliomyelitis, scarlet fever, measles, and whooping cough may simulate a cold.

Symptoms begin gradually and vary considerably from person to person. Malaise, chills, headache, watery eyes, running nose, sneezing, and some roughness of the throat with little or no fever usually continue four to five days.

Physical signs are red, edematous nasal mucosa with obstruction and discharge. Maxillary and frontal sinuses may be slightly tender, but anterior cervical lymph nodes are seldom enlarged or very sore. Involvement for more than a week with oral temperature above 100 degrees Fahrenheit generally indicates a complication or some other type of infection.

No known drug is effective against colds. The treatment of uncomplicated cases is general and symptomatic. But rest is the best therapy and is mandatory with fever. Liquids should be taken in abundance and a warm moist, but not too steamy, room is comforting.

Symptoms may be ameliorated by the use of (1) vasodilators and diaphoretic agents, such as alcohol in moderation, (2) hot baths, and (3) drugs. A useful preparation is 5 milligrams of belladonna extract, 10 milligrams of codeine sulfate, 200 milligrams of Phenacetin, 300 milligrams of aspirin and 2 milligrams of Chlor-Trimeton. The antihistamine is added for a possible allergic component. A capsule is taken every four to six hours.

In the early stage, inhalers may be used to a limited extent, but no medicine is instilled into the nostrils. Cough is relieved by elixir of terpin hydrate alone or with codeine or by a spoonful of honey and whiskey in equal parts.

Antibiotics are not given unless bacterial complications are observed or expected from the patient's past record or from widespread current infections. A broad-spectrum drug

(Continued on page 82)

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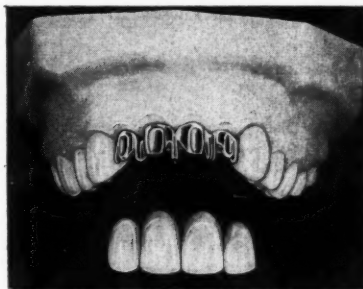
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Slightly Controversial

There came a time early in the nineteenth century when philosophers, metaphysicians, and scientists found the age old questions unanswered. The reasons for this were that the questions themselves became meaningless and new questions arose which before had not been thought of.

A similar transition is occurring in dentistry, though many of the questions remain the same. This time, however, we are finding that the answers are not adequate and that many are actually untrue.

For example, we might state the familiar question, how do we protect the pulp from the thermal changes incident to the placement of a large filling? The classic answer is to use a protective base of oxyphosphate of zinc cement. However, recent articles have questioned the liquid used as being definitely injurious to the pulp. Our answer to the above question is to use a calcium hydroxide base in the form of Kal-Drox. The liquid used in Kal-Drox has been found to be far less injurious to the pulp than the orthophosphoric acid of the zinc cement.

The question itself may be

somewhat meaningless eventually, as it may soon be possible to use non-metallic fillings, and a start in this direction has already been made. P. F. and PEARLON, in their new color stable form, should take care of all anterior and posterior fillings, with the exception of Class II's. We believe that mesial Class II's on the upper and lower first bicuspid could also be included for esthetic reasons.

Even during our own lifetime, questions and answers have become obsolete. The classicism of the periodic table of early twentieth century chemistry has been questioned and found wanting. The same holds true for the wave theory of light. Particles, not waves, are the carriers of our visible and invisible spectrum.

So it is not sacrilege to question many of the age old principles in dentistry, and there is no less honor to Black if at some future time we find his principles outmoded.

Some years ago, we propounded in this magazine a concept of cavity preparation based upon no undercuts, upon the conservation

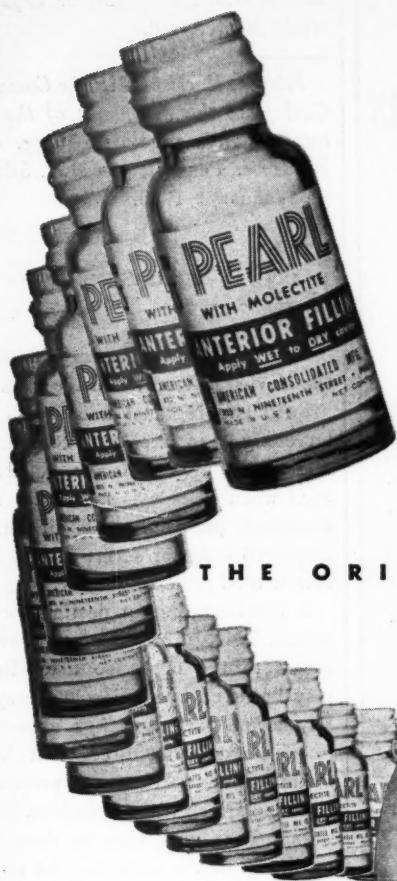
of all live tissue structure, upon the elimination of the decay only, without resort to conventional cavity preparation. Such a premise was conditioned on the tenaciousness of two new filling materials, each containing an adhesive, P.F. and PEARLON. But the conditioned minds of thousands of dentists rebelled against such a theory.

Yet in our own practice such conservation of vital tooth structure has been routine and we propound it again for the consideration of the more forward thinkers in our profession.

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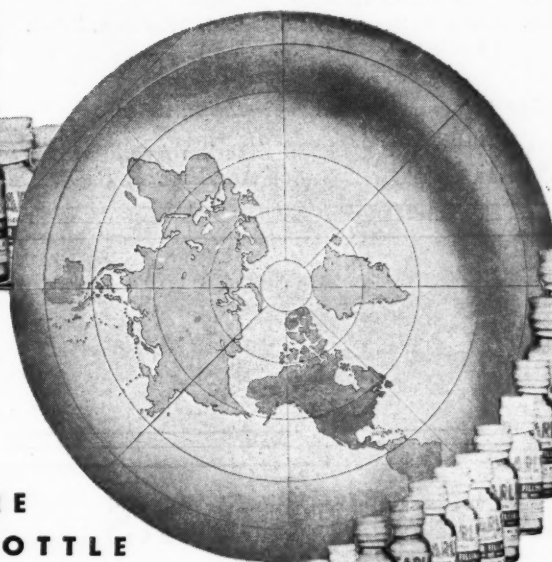
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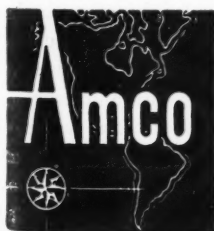
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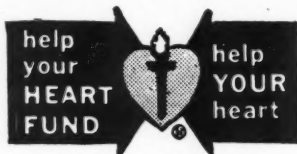
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such as oral tetracycline or Erythro-mycin is preferred.

Flippin, Harrison F.: *The Common Cold from the Viewpoint of the Internist, Otolaryngologist, Allerg. and Pediatric.* Pennsylvania M. J. 58:29-40 (January) 1955.



Oral Cancer

Few intraoral cancers spread below the clavicles. Removal of the primary growth and regional nodes with intervening lymphatics by a continuous dissection may, therefore, be effective even when disease is advanced. The combined procedure was originally employed only for severe lesions but is now used more frequently.

A hemimandible or partial jaw resection is frequently done to provide access to the operative field. Bone may be saved by section at the symphysis and rewiring after dissection of the neck. If not directly involved, the mandibular arch can be preserved by an exteriorization procedure. Temporary bone graft may be done immediately or the arch may be maintained by wires inserted between fragments or by plastic devices.

Surgery is required for the following conditions: (1) Tumors that recur or persist after irradiation, if tissue appears resectable. (2) Bone invasion. If sterilizing rays are applied, necrosis occurs and tissue repair and healing processes are impaired by infection and poor blood supply. Bone graft or plastic repair is easier in nonirradiated tissues. (3) Tumors of minor salivary glands. The lesions are rarely curable by any method, but surgery is preferred to radiation for both elimination of disease and restoration of function. (4) Adamantinomas. The malignant epithelial tumors of bone grow slowly and may persist for years, but radiotherapy or temporizing operation is futile. (5) Sarcomas and neurogenic tumors. Lymphosarcoma is the only sarcoma of the oral cavity that is radiosensitive. (6) Radiation cancer. (7) Cervical lymph node metastases. Only one focus may be apparent, but



Nature came up with some of the weirdest adaptations around the time of Triceratops (the old boy shown above). Man's adaptations, less visibly apparent but more practical, have often come from his own inventive hands.

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involvement is generally multiple. Bilateral radical dissection with removal of both jugular veins may be done in one stage.

Excision is the preferred treatment for superficial exophytic lesions, es-

pecially about the tip of the tongue. Surrounding leukoplakic areas, if present, are also completely excised, since leukoplakia is precancerous and differs from the carcinoma in radio-sensitivity.

Operation is also recommended for isolated keratinizing squamous cell lesions at the tongue base with involvement of the throat wall. Rates of cure at least equal those of radiation, and clean wound healing is an advantage.

Since effects of radiation are permanent and progressive, surgery is preferred for young patients. Exposure of the face to sun over a period of many years can be harmful if external irradiation is employed.

Surgery is optional for small superficial oral cancers. Lesions on the side of the tongue, particularly, can be excised easily. Tissues mend in five or six days, in contrast to radiation reaction of five or six weeks.

Slaughter, Danely P.: Surgical Management of Intraoral Cancer, Am. J. Roentgenol. 73:605-610 (April) 1955.



Pleural Effusion

Probably most patients with pleurisy recover completely. Pleurisy with effusion, however, is not an isolated local infection. In some instances, extrathoracic tuberculosis appears concurrently or subsequently and dissemination of tubercle bacilli after infection is rapid. Tuberculous lesions may also be found by liver biopsy.

Acute serofibrinous pleurisy with effusion in a young adult with a positive tuberculin reaction and no demonstrable tubercle bacilli in sputum, gastric washings, or pleural fluid should be diagnosed and treated as tuberculous.

In a tuberculin-sensitive person, this form of pleurisy is apparently caused by perforation of a subpleural tubercle with discharge into the pleural space of living and dead tubercle bacilli and caseonecrotic material containing tuberculoprotein. The later course of the disease depends largely upon the infecting dose. Perforation of a large caseous lesion with persistent caseonecrotic communications with the pleura will cause a serious disease state. Bed rest and chemotherapy are recommended to reduce

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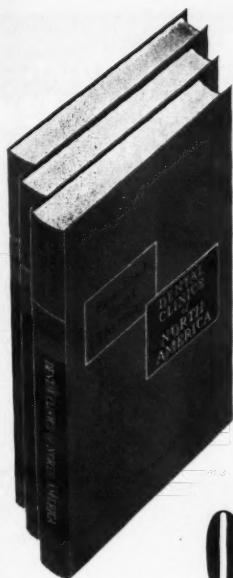
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Contents-March Number

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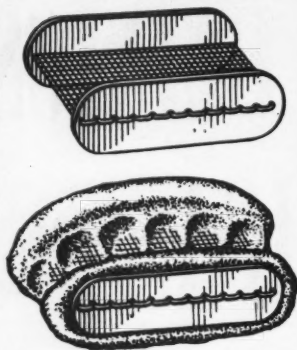
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the risk of subsequent relapse.

In a series of 141 young male adults in military service who had primary serofibrinous pleural effusions all reacted positively to intracutaneous tuberculin. None had chemotherapy for the initial illness. The tuberculous etiology was proved bacteriologically in 51 patients, 33 of whom later experienced relapse. Of 90 patients whose original fluids were not examined adequately or contained no tubercle bacilli, 50 later had active tuberculosis. Relapse was as frequent with small effusions as with large ones. Return to normal physical activity after brief hospitalization resulted in relapse with active tuberculosis in over 90 per cent of 66 persons. About 90 per cent of 92 subjects had active tuberculosis within three years after onset of the original pleurisy. Extrapulmonary tuberculosis usually becomes evident within nine to fifteen months after onset of pleurisy.

Roper, William H., and Waring, James J.: *Primary Serofibrinous Pleural Effusion in Military Personnel*, *Am. Rev. Tuberc.* 71:616-634 (July) 1955.

Focal Infection

FOCAL infection as a possible cause of ill health is no longer a theory but is firmly established in both medicine and dentistry. Primary foci may be circumscribed or diffuse, acute or chronic, single or multiple. Their detection frequently requires considerable skill and experience.

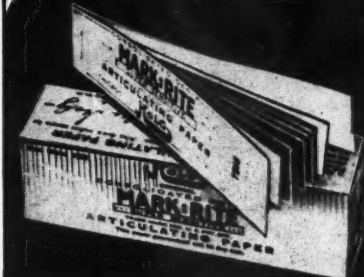
Secondary Conditions — Diseases which may be due to direct mucosal continuity, transient bacteremias, absorption of toxins, or acquired allergic sensitization to the soluble products of bacteria include not only subacute bacterial endocarditis and the infective arthritides, but also some of the fibrositides, pyodermias, and infections of the lower respiratory tract, kidneys, eyes, and brain.

Resistance May be Acquired—Many escape illness, at least temporarily, due to natural or acquired resistance, escape from acquired allergic sensitization, or the absence of other factors favoring the development of secondary diseases.

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Periodic Dental Care Advised

Physicians should insist on periodic dental care for adults and for children three years of age or older, and whenever possible, also on the prevention of caries and the eradication of primary foci of infection of dental or other location. This requires sound clinical judgment in order to avoid the needless extractions of teeth.

Adapted from *Postgraduate Medicine* 20:312 (September) 1956.

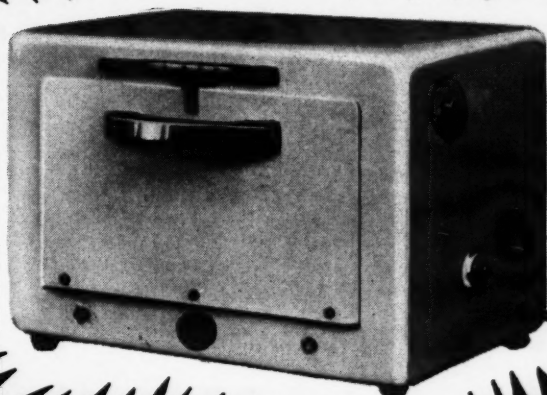
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Contra- Angles



Reading for Dentists Sixty Years Ago

It has been awhile since we quoted from the writings of the first seer on dental practice management—Charles R. Hambly, D.D.S. (1897). Fortunately for the good of dental literature the sob sister touch has gone out of writing for dentists—and for most other consumers of the printed word. Shortly before and soon after the turn of the century the heart throb, the emotional tear jerker, was the technique used to appeal to readers. Any writer worthy of his pen felt that he must exalt virtue and denounce sin at every chance. Point a moral he must, even in a subject like dental practice etiquette and management.

The transformation of Joe Evans, D.D.S. from a low and uncouth beer drinker and smoker to a man of substance is a love story that may have appealed to dentists sixty years ago, but I doubt it. Here it is:

"Joe Evans was a great, burly, sleepy, loose-jointed fellow. At the dental college he was a football for the whole school. All had the privilege of kicking him about, just for the fun of the exercise.

"When he opened a dental office he was not improved in his appearance or manners. He was the same coarse, gaunt, slouchy boy, given to slang, lawlessness and vulgarity. He would have been an entire failure but for his acknowledged skill; for with all his defects he was a genius. People would patronize him in spite of his uncouth ways. His smoking, too, was specially objectionable. But as for that, his breath smelt of stale beer quite as much as of nasty tobacco. Of course, his office and instruments and his whole surroundings were of the same sort.

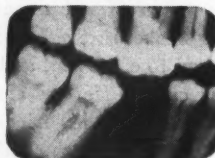
"He was the antipodes of sentiment-

alism. He was gruff and unmannerly toward the 'weaker sex,' as he was specially pleased to call them, as he was toward his chums. He was almost a woman hater, which his friends believed accounted for much of his lawlessness and want of business ambition. True it is that love, and the object of love, makes or breaks many a young man, and the want of this tender sentiment makes an unkempt, ill-mannered, lawless fellow.

"He was fond of games, horse-racing and field sports, and was 'hail fellow well met' with boys generally. Even with his dental office on hand, business or no business, he must have a day off occasionally, and sometimes a night too; and these nights were spent in the greater dissipation. Of course, he had chosen for his location the poorer part of the city, for he had sense enough to know he could not thrive in the better circles.

"All at once Joe Evans fell in love. Yes, he did; he fell in love all over. The awful malady seized every part of his nature and upset him terribly. And, what is singular, the object of

pain from hypersensitive dentine relieved in all of 92 patients¹



In a new study of Thermodent involving 571 observations on 92 patients, Fitzgerald found that 42 per cent had complete relief of dentine hypersensitivity, 30 per cent good relief, and "all patients in this series reported at least some benefit."¹

Often complained of, seldom controlled — that is the usual status of *hypersensitive dentine*. Until now, patients have had to depend on infrequent office treatments in the sensitive areas for relief of pain caused by contact with cold, hot, salt, acid, or sweet food.

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1. Fitzgerald, G.: Dental Digest 62:494 (Nov.) 1956.

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his love was a little, delicate creature, the most directly opposite to himself in every way. It was just laughable to see them walking together—he a great, strapping, awkward, disjointed fellow, six feet three, taking long, heavy, ungainly steps, and she, tripping along by his burly side, hardly knowing how to behave herself.

"Joe Evans died. 'To let' was on his office door. His chums mourned his loss, and so did his numerous clubs. The beer saloons and tobacco joints also mourned him, and his patrons did, for they could no longer have good work done at half price."

* * * * *

"That is a straight, spruce, dignified-looking gentleman with that vivacious intelligent lady in the dress circle," said I to a friend at a social gathering.

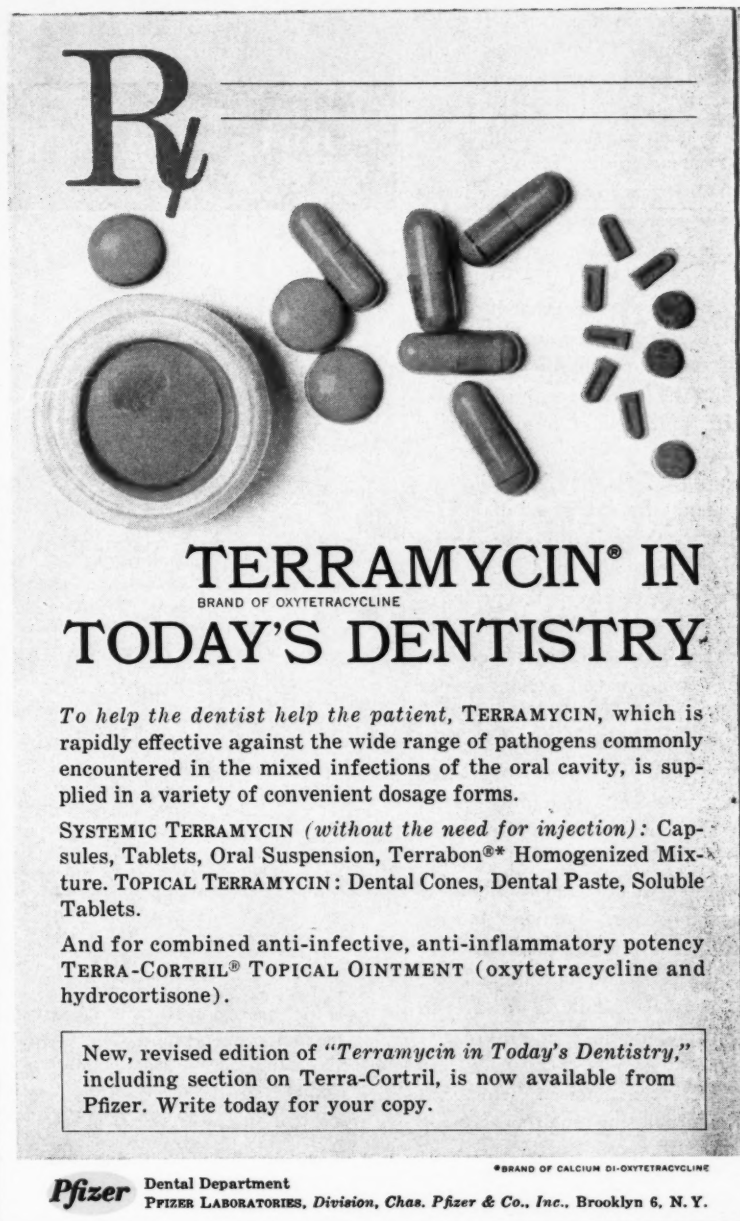
"Yes," was the response, "he is a modest and refined gentleman and extremely enterprising. He and his wife are often the center of attraction. They are specially gifted at the piano. Both are expert players and singers. They are newcomers and in every way acceptable."

"While in the aristocratic section of the city of C..... I was desirous of having the tartar taken off my teeth. Surely, any dentist could do this. But I was particular, and making inquiry of a business man for the best dentist in the city, he said:

"I can direct you to just your man. He is the favorite of everyone, and is specially skillful."

"What was my surprise to find this was our old friend, Joe Evans! No, not Joe, he was dead; but Dr. Joseph R. Evans, a professional gentleman, every inch of him, in appearance and manners. The love of a pure, lovely, intelligent woman had transformed him into another man. He and his lovely wife were those we met at the entertainment. No wonder we did not know him there. She had so thoroughly drawn him out of his past life, and so enamored him with all that is good and true, refined and esthetic, that he was a noble man. His gentleness, suavity and genuine kind-heartedness had changed his whole nature and made him the favorite of his profession.

"I asked him what could have pos-



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sibly made such a wonderful change.

"He replied: 'Only a determination to be, in my habits and character, as good as my wife.'"

In his Horatio Algerian essay on "Success" Hamblly is at his flamboyant best, or worst, according to the reader's point of view. It is hard to believe that this kind of drivel and drip appealed to dentists at any time. Here is the ghastly example:

"The successful man is he who by the greatest good gives the greatest happiness to the greatest number. He wipes from the cheek of sorrow the

tear of grief. He stands where chilly, biting winds blow hard on him, if perchance he may shield some tender fellow-creature from its blast. He steps aside in the gutter to raise again to its feet some fallen form. He prattles with infancy, smiles on youth, firmly grasps the hand of middle life, and smooths the wrinkles of old age. He lifts the helpless, cheers the despondent, weeps with the bereaved, and rejoices with the light of heart. He gives to the needy, censures the niggard, spurns the miser, and bitterly resents the affectations of the insincere. He plants

in every human heart the fragrant flower of hope, and nourishes it with the perfume of his own happiness. He believes in love, in charity, in friendship, in companionship; and, above all, he has an abiding faith in his fellow man. He is a firm believer in the ultimate good of humanity, and his own life forms the strongest evidence in favor of this belief. He sees something good in the character of the vilest son of Adam, but is not beyond believing in the possibility of a weakness in a reputed Sampson of morals. He wishes for the best, but is prepared for the worst.

"The successful man is not he who lives simply for the greed of gain—who sees nothing in life save the accumulation of dollars and dimes. The Croesus of Wall Street, the prince of the bull pit in the Chicago Board of Trade, the bonanza king of the West, or the men who make financial Europe tremble with the touch of a pen, are not successful unless they have elements in their lives other than those which claim the attention of the world.

"The statesman, standing before the lawmakers of the land and swaying the destinies of a nation by the force of his eloquence, is envied for his genius and ability; and yet his life, as measured by the one crucial test of all, may be a failure worse than that of the humblest citizen of the domain.

"The preacher, poised before his flock, and pointing out the way for them to tread, may miss the way himself.

"The lawyer, doctor, artist, author, actor, all may win renown in the world and yet fall short of that which constitutes success.

"To be successful, a man must be happy; for in all the weight of argument there is no one truth which so well stands the test of time and experience as this which says that 'happiness is the greatest good.'

"A man may be renowned and ruined—he may be rich and wretched. He may stand erect with a smile to the world and fall to his knees weeping in the quiet of his own closet.

"And after all, the success of a man's life is measured more by the

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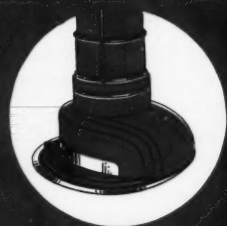
influences which surround him in the routine of his every-day experience than by any other criterion.

"Let me tell you who the really successful man is. It is he who, as a boy, was cherished by the love of a noble mother; who, as a young man, was absorbed by the love of a loyal girl; who, ever after, is sustained by the love of a tender wife.

"It is he who gathers around him the comforts of a home, who tastes the sweets of domestic happiness. It is he who feels around his neck the cling-

ing, thrilling arms of children, who feels on his own roughened cheek the soft and velvety cheek of his babe. It is he around whose heart the precious tendrils twine, and in whose soul are sown the seeds of love which sweeten life and add a fragrance to the time when nature dons the 'sere and yellow leaf.' The successful man is he who loves and is loved from the rosy dawn of life's new morn, through the heat and burden of the mid-day sun, till at last his sleepy eyelids are kissed to rest by the cooling winds from na-

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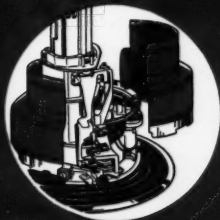
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Base swivel and swivelling mechanism are integral part of chair's design and are completely concealed.



Primary Tuberculosis of the Mouth

WHEN PRIMARY tuberculosis appears in unfamiliar situations, it is apt to be missed or misdiagnosed. Tuberculous ulcers in the mouth are familiar as a complication of pulmonary tuberculosis, but reports of cases in which the mouth was the site of a primary infection are scanty in the British and American literature, and most of them have appeared since 1950. Three cases were reported in 1953, and careful examination of patients with submandibular adenitis has resulted in the publication of a report of seven cases in children and adolescents. This suggests that the condition is not so rare as had been supposed and that more cases would be found if they were more diligently sought.

Difficulties in Diagnosis—As the primary ulcer in the mouth is usually small and painless, the patient may make no complaint, even if he is aware of its presence. Attention is drawn to the existence of tuberculous disease by swelling of the related lymph nodes, most often those of the submandibular group. There is a tendency to attribute tuberculous cervical adenitis to a primary infection of the faucial tonsils, and the possibility of a focus in some other part of the wide drainage area of those nodes is often not considered. Injury to the oral mucous membrane is important in allowing the infection to become established. In a majority of the cases reported by one authority there was a history of dental trauma by tooth extraction or alveolar abscess; but the injury may be trivial and unnoticed. A definite history pointing to a source of infection appears to be unusual. The tubercle bacilli may be of either human or bovine type.

Pathologic Features—The primary focus is an ulcer in a tooth socket, or on the gum or other part of the oral mucous membrane. The infection spreads rapidly to the regional lymph nodes, which enlarge and are at first firm but later tend to soften

ture's night of death."

For a change of pace let us move from the writings of Hamby, that are humorous without meaning to be, to real literary expression. The esteemed British surgeon, Sir Berkeley Moynihan, described the hand that holds the surgeons' instruments:

"The scalpel is, indeed, an instrument of most precious use—in some hands a royal sceptre; in others but a rude mattock. The perfect surgeon must have the 'heart of a lion and the hand of a lady'; never the claws

of a lion and the heart of a sheep."

From time to time we will take other looks at the writings of Hamby. I suppose that they represent a slice of dental Americana. They are stilted, dull, pompous, dated. I would like to think that dentists have become more cultured and sophisticated in the past sixty years. The writing of Sir Berkeley Moynihan represents the cultured mind in medicine. Dentistry could use more of this kind of maturity and philosophy.

—E. J. R.



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and break down. The primary ulcer may be small and may heal without trace while disease in the lymph nodes is still active, but in some cases a scar remains at its site. As in any case of primary tuberculosis, hematogenous dissemination is a pos-

sibility. One of the patients in a series reported developed tuberculous meningitis. In all these cases the primary ulcer healed rapidly on chemotherapy and the lymph nodes diminished in size.

Treatment—A high incidence of

recrudescence of active disease in the lymph nodes within a few weeks or months, sometimes with formation of abscess led to the conclusion that there is a case for excision of the enlarged nodes while they are still firm. Most of the patients, however, had only a short course of streptomycin. Six months' combined chemotherapy has been recommended.

Detection of Oral Tuberculosis—It is recommended that any chronic ulcer of the mouth that does not heal should be examined histologically; and that primary tuberculosis should be suspected and an oral ulcer looked for when the submandibular lymph nodes are found to be enlarged.

Adapted from *British Medical Journal* 4985:147 (July 21) 1956.

Management of Patients in Poor Physical Condition

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One of the basic principles of anesthesia is to provide as light anesthesia as possible, consistent with surgical requirements. However, light anesthesia has been accompanied by difficulties: (1) respiratory obstruction and laryngospasm particularly from reflex causes; (2) unfavorable operating conditions due mainly to inadequate muscle relaxation; (3) failure to block undesirable visceral and somatic reflexes.

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Adapted from *Current Researches in Anesthesia & Analgesia* 35:606 (November-December) 1956.

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